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SERVICE MANUAL
OSCILLOSCOPE

COS5020TM/COS5021TM
COS5040TM/COS5041TM

MP MASTER
MA35559

KIKUSUI

SERVICE MANUAL

OSCILLOSCOPE

COS5020TM / COS5021TM

COS5040TM / COS5041TM

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1. GENERAL

1.1 General Description

The Kikusui Model COS5020TM/5021TM/5040TM/5041TM is a dual-channel oscilloscope having the maximum sensitivity of 1 mV/DIV and maximum sweep time of 20 ns/DIV. It employs a 6-inch rectangular cathode-ray tube with red internal graticule. The frequency bandwidth is 20 MHz for COS5020TM/5021TM and 40 MHz for COS5040TM/5041TM.

The COS5021TM and COS5041TM have a delay sweep function.

The COS5020TM/5021TM/5040TM/5041TM is a sturdy and easy-to-operate oscilloscope having various functions required not only for production lines and maintenance services but also for the research and development of electronic devices in various fields.

1.2 Features

(1) Compactness, lightness, and sturdiness

The oscilloscope is made of styrene acrylonitrile butadien and steel plates. It is compact, light, and sturdy.

(2) Excellent operability

Light torque lever switches and pushbutton switches are used, taking purposes and frequencies of their uses into consideration. The switches are laid out in the most rational locations to attain the best operability.

(3) High brightness CRT with high acceleration voltage

The CRT of COS5020TM/5021TM has the acceleration voltage of 2.2 kV (constant acceleration), and that of COS5040TM/5041TM is a domed mesh type CRT adopting post acceleration. The post acceleration voltage is as high as 12 kV. Since both of the CRTs are high brightness CRTs with high beam transmittivity, even high speed sweep waveforms can be observed clearly on them.

(4) Low drift and high stability vertical axis amplifier

The oscilloscope employs a newly developed temperature compensation circuit in its vertical axis amplifier, thereby greatly reducing drift of base lines and DC balance disturbance caused by temperature change.

(5) Trigger level lock function to eliminate triggering adjustment

Since the oscilloscope has a trigger level lock circuit, the troublesome triggering adjustment procedure can be eliminated not only for regular signals but also for the signals of great duty cycle ratios and video signals.

(6) TV synchronizing signal separator circuit linked to sweep time

The TV sync signal separator circuit linked to the TIME/DIV switch separates the TV vertical sync signal (TV-V) at the time of low speed sweep (0.5 s to 1 ms/DIV) and TV horizontal sync signal (TV-H) at the time of high speed sweep (0.5 ms to 0.2 μs/DIV). Therefore, the user need not select the trigger signal each time the time scale is changed.

(7) Linear focus to follow intensity

Once the focus is adjusted to the optimum position, the best focus is always maintained automatically irrespective of the change in intensity. It is maintained even for the waveforms with intensity variation such as those displayed in A INT mode.

* FOR COS5020TM/COS5021TM

Vertical axis

Item	Specification	Remarks
Sensitivity	NORM : 5 mV - 5 V/DIV ×5 MAG: 1 mV - 1 V/DIV	1-2-5 sequence, 10 ranges
Sensitivity accuracy	NORM : ±3% or better ×5 MAG: ±5% or better	10 to 35°C (50 to 95°F), 1 kHz, at 4 or 5 DIV
Vernier vertical sensitivity	To 1/2.5 or less of panel indicated value	
Frequency brandwidth	NORM : DC - 20 MHz, within -3 dB ×5 MAG: DC - 15 MHz, within -3 dB AC coupling: Low limit frequency 10 Hz	With reference to 50 kHz, 8 DIV
Rise time	NORM : 17.5 nsec or less	×5 MAG: 23 nsec or less
Input impedance	1 MΩ ±2%, 25 pF ±2 pF	
Display modes	CH1: CH1 single channel ALT: CH1 and CH2 signal are displayed altenately CHOP: CH1 and CH2 are chopped in sequence ADD: CH1 + CH2 algebraic addition CH2: CH2 single channel	
Chopping repetition frequency	Approx. 250 kHz	
Input coupling	AC/GND/DC	
Polarity change	CH2 only	
Maximum allowable input voltage	400 V peak (DC + AC peak)	AC: 1 kHz or lower
CH1 signal output	Approx. 100 mV/DIV when open; approx. 50 mV/DIV when 50-ohm termination	

Triggering

Item	Specification	Remarks
Internal trigger selection (INT TRIG)	CH1, CH2 and "VERT MODE" (Trigger source is selected depending on the vertical operation mode.) When in ADD and CHOP, the CH1 input signal is used at the trigger source signal	VERT MODE function works in ALT sweep MODE between CHs and single CH alone operation
A trigger		
Signal source	INT, LINE, EXT	
Coupling	AC, HF REJ, TV, DC	
Polarity	+ or -	
Sensitivity	DC - 10 MHz : 0.5 DIV (0.1 V) DC - 20 MHz : 1.5 DIV (0.2 V) Video signal: 2.0 DIV (0.2 V) AC coupling: Attenuate signal components of lower than 10 Hz HF REJ: Attenuate signal components of higher than 50 kHz	The values enclosed in the parentheses are the input sensitivities when in the EXT triggering mode.
Triggering modes	AUTO: Sweeps run in the free mode when no triggering input signal is applied	Satisfies the sensitivity specification for signal repetition frequency of 50 Hz or over
	NORM: When no triggering signal is applied, the trace is in the READY state and not displayed	

Triggering (cont'd)

Item	Specification	Remarks
Triggering modes (cont'd)	SINGL: One-shot sweep with triggering signal. Can be reset to the READY state by means of RESET switch. The READY lamp (LED) turns on when in the READY state or in the sweep operation.	
LEVEL LOCK	Satisfies the value of the above trigger sensitivity plus 0.5 DIV (0.05 V). At sine wave (50 Hz - 20 MHz).	
EXT triggering signal input	EXT HOR input terminal is used in common.	
Input impedance	1 MΩ ±2%, approx. 25 pF	
Maximum allowable input voltage	100 V peak (DC + AC peak)	AC frequency not highter than 1 kHz
B triggering signal	The A triggering signal of main sweep is used as the B triggering signal.	Model COS5021TM only

Horizontal axis

Item	Specification	Remarks
Horizontal axis display	A, A INT, B, B TRIG'D	COS5021TM only
A sweep (main sweep)		
Sweep time	NORM: 0.2 µsec - 0.5 sec/DIV	1-2-5 sequence, 20 ranges
Sweep time accuracy (1)	±3%	10 to 35°C (50 to 95°F) Accuracy of sweep time for 8 divisions in graticule center
Sweep time accuracy (2)	±3%	10 to 35°C (50 to 95°F) When one time marker is assigned to each graticule division and the 2nd and 10th markers are aligned to the graticule lines, accuracy of each marker with respect to the 10 divisions, except the 1st and 11th markers.
Vernier sweep time control	To 1/2.5 or slower of panel-indicated value	
Holdoff time	Continuously variable	
Sweep magnification	10 times (maximum sweep time 20 nsec/DIV)	
Magnified sweep time accuracy (1)	1 µsec - 0.5 sec/DIV: ±5% 0.2 µsec - 0.5 µsec/DIV: ±8%	10 to 35°C (50 to 95°F) Accuracy of sweep time for 8 divisions in graticule center, excluding 10%-portions from both ends of sweep

Horizontal axis (cont'd)

Item	Specification	Remarks
Magnified sweep time accuracy (2)	1 µsec - 0.5 sec/DIV: ±5% 0.2 µsec - 0.5 µsec/DIV: ±8%	10 to 35°C (50 to 95°F) When one time marker is assigned to each graticule division and the 2nd and 10th markers are aligned to graticule lines, accuracy of each marker with respect to the 10 divisions, excluding the 1st and 11th markers and 10%-portions from both ends of sweep.
B sweep		COS5021TM only
Delay system	Continuous delay and triggered delay	Triggered by A triggering signal
Sweep time	NORM: 0.2 µsec - 0.5 msec/DIV	
Sweep time accuracy	NORM: ±3%	10 to 35°C (50 to 95°F)
Point-to-point time measurement range	2 µsec - 5 sec/DIV	
Delay jitter	1/10,000 or less $\frac{\text{B sweep time}}{\text{A sweep time}} \times \frac{\text{Jitter width}}{\text{10 DIV}}$	Jitter width 1.0 DIV or less at A: 1 msec/DIV B: 1 µsec/DIV
EXT HOR mode	Trace swept by an input signal through terminal connected in common to EXT TRIG input terminal. ALL mode which are selectable for VERT MODE can be selected. If set to ALT or CHOP mode, operation is in CHOP mode for dual trace display.	

Horizontal axis (cont'd)

Item	Specification	Remarks
Sensitivity	Approx. 0.1 V/DIV	
Frequency bandwidth	DC - 1 MHz (-3 dB)	
Phase difference between vertical axes	Within 3° (at DC - 50 kHz)	

X-Y mode

Item	Specification	Remarks
Inputs	X-axis: CH1 input signal Y-axis: CH2 input signal	
X-axis sensitivity	Same as CH1 vertical axis	
Sensitivity accuracy	NORM : ±4% x5 MAG: ±6%	10 to 35°C (50 to 95°F) 1 kHz, at 4 or 5 DIV
Frequency bandwidth	DC - 1 MHz (-3 dB)	
Y-axis sensitivity	Same as CH2 vertical axis	
Sensitivity accuracy	Same as CH2 vertical axis	
Frequency bandwidth	Same as CH2 vertical axis	
X-Y phase difference	Within 3° (at DC - 50 kHz)	

Z axis

Item	Specification	Remarks
Sensitivity	3 Vp-p (Trace becomes brighter with negative input)	
Frequency bandwidth	DC - 5 MHz	
Input resistance	Approx. 5 kΩ	
Allowable input voltage	50 V peak (DC + AC peak)	AC frequency not higher than 1 kHz

Calibration voltage

Item	Specification	Remarks
Waveform	Positive-going square wave	
Frequency	1 kHz ±20%	
Output voltage	0.5 Vp-p, ±2%	
Output resistance	Approx. 500 Ω	

CRT

Item	Specification	Remarks
Type	6-inch rectangular type, internal graticule	
Phosphor	P31	
Acceleration voltage	Approx. 2.2 kV	
Effective screen size	8 × 10 DIV	1 DIV = 10 mm (0.39 in.)
Graticule	Internal graticule; continuously adjustable illumination	

* FOR COS5040TM/COS5041TM

Vertical axis

Item	Specification	Remarks
Sensitivity	NORM : 5 mV - 5 V/DIV ×5 MAG: 1 mV - 1 V/DIV	1-2-5 sequence, 10 ranges
Sensitivity accuracy	NORM : ±3% or better ×5 MAG: ±5% or better	10 to 35°C (50 to 95°F), 1 kHz, at 4 or 5 DIV
Vernier vertical sensitivity	To 1/2.5 or less of panel indicated value	
Frequency brandwidth	NORM : DC - 40 MHz, within -3 dB ×5 MAG: DC - 20 MHz, within -3 dB AC coupling: Low limit frequency 10 Hz	With reference to 50 kHz, 8 DIV
Rise time	NORM : 8.75 nsec or less	×5 MAG: 17.5 nsec or less
Signal delay	With delay cable	
Input impedance	1 MΩ ±2%, 25 pF ±2 pF	
Display modes	CH1: CH1 single channel ALT: CH1 and CH2 signal are displayed altenately CHOP: CH1 and CH2 are chopped in sequence ADD: CH1 + CH2 algebraic addition CH2: CH2 single channel	
Chopping repetition frequency	Approx. 250 kHz	
Input coupling	AC/GND/DC	
Polarity change	CH2 only	
Maximum allowable input voltage	400 V peak (DC + AC peak)	AC: 1 kHz or lower
CH1 signal output	Approx. 100 mV/DIV when open; approx. 50 mV/DIV when 50-ohm termination	

Triggering

Item	Specification	Remarks
Internal trigger selection (INT TRIG)	CH1, CH2 and "VERT MODE" (Trigger source is selected depending on the vertical operation mode.) When in ADD and CHOP, the CH1 input signal is used at the trigger source signal	VERT MODE function works in ALT sweep MODE between CHs and single CH alone operation
A trigger		
Signal source	INT, LINE, EXT	
Coupling	AC, HF REJ, TV, DC	
Polarity	+ or -	
Sensitivity	DC - 10 MHz : 0.5 DIV (0.1 V) DC - 40 MHz : 1.5 DIV (0.2 V) Video signal: 2.0 DIV (0.2 V) AC coupling: Attenuate signal components of lower than 10 Hz HF REJ: Attenuate signal components of higher than 50 kHz	The values enclosed in the parentheses are the input sensitivities when in the EXT triggering mode
Triggering modes	AUTO: Sweeps run in the free mode when no triggering input signal is applied	Satisfies the sensitivity specification for signal repetition frequency of 50 Hz or over
	NORM: When no triggering signal is applied, the trace is in the READY state and not displayed	

Triggering (cont'd)

Item	Specification	Remarks
Triggering modes (cont'd)	SINGL: One-shot sweep with triggering signal. Can be reset to the READY state by means of RESET switch. The READY lamp (LED) turns on when in the READY state or in the sweep operation.	
LEVEL LOCK	Satisfies the value of the above trigger sensitivity plus 0.5 DIV (0.05 V). At sine wave (50 Hz - 40 MHz).	
EXT triggering signal input	EXT HOR input terminal is used in common.	
Input impedance	1 MΩ ±2%, approx. 25 pF	
Maximum allowable input voltage	100 V peak (DC + AC peak)	AC frequency not highter than 1 kHz
B triggering signal	The A triggering signal of main sweep is used as the B triggering signal.	Model COS5041TM only

Horizontal axis

Item	Specification	Remarks
Horizontal axis display	A, A INT, B, B TRIG'D	COS5041TM only
A sweep (main sweep)		
Sweep time	NORM: 0.2 µsec - 0.5 sec/DIV	1-2-5 sequence, 20 ranges
Sweep time accuracy (1)	±3%	10 to 35 °C (50 to 95 °F) Accuracy of sweep time for 8 divisions in graticule center
Sweep time accuracy (2)	±3%	10 to 35 °C (50 to 95 °F) When one time marker is assigned to each graticule division and the 2nd and 10th markers are aligned to the graticule lines, accuracy of each marker with respect to the 10 divisions, except the 1st and 11th markers.
Vernier sweep time control	To 1/2.5 or slower of panel-indicated value	
Holdoff time	Continuously variable	
Sweep magnification	10 times (maximum sweep time 20 nsec/DIV)	
Magnified sweep time accuracy (1)	1 µsec - 0.5 sec/DIV: ±5% 0.2 µsec - 0.5 µsec/DIV: ±8%	10 to 35 °C (50 to 95 °F) Accuracy of sweep time for 8 divisions in graticule center, excluding 10%-portions from both ends of sweep

Horizontal axis (cont'd)

Item	Specification	Remarks
Magnified sweep time accuracy (2)	1 µsec - 0.5 sec/DIV: ±5% 0.2 µsec - 0.5 µsec/DIV: ±8%	10 to 35 °C (50 to 95 °F) When one time marker is assigned to each graticule division and the 2nd and 10th markers are aligned to graticule lines, accuracy of each marker with respect to the 10 divisions, excluding the 1st and 11th markers and 10%-portions from both ends of sweep.
B sweep		COS5041TM only
Delay system	Continuous delay and triggered delay	Triggered by A triggering signal
Sweep time	NORM: 0.2 µsec - 0.5 msec/DIV	
Sweep time accuracy	NORM: ±3%	10 to 35 °C (50 to 95 °F)
Point-to-point time measurement range	2 µsec - 5 sec/DIV	
Delay jitter	1/10,000 or less $\frac{\text{B sweep time}}{\text{A sweep time}} \times \frac{\text{Jitter width}}{\text{10 DIV}}$	Jitter width 1.0 DIV or less at A: 1 msec/DIV B: 1 µsec/DIV
EXT HOR mode	Trace swept by an input signal through terminal connected in common to EXT TRIG input terminal. ALL mode which are selectable for VERT MODE can be selected. If set to ALT or CHOP mode, operation is in CHOP mode for dual trace display.	

Horizontal axis (cont'd)

Item	Specification	Remarks
Sensitivity	Approx. 0.1 V/DIV	
Frequency bandwidth	DC - 2 MHz (-3 dB)	
Phase difference between vertical axes	Within 3° (at DC - 100 kHz)	

X-Y mode

Item	Specification	Remarks
Inputs	X-axis: CH1 input signal Y-axis: CH2 input signal	
X-axis sensitivity	Same as CH1 vertical axis	
Sensitivity accuracy	NORM : ±4% ×5 MAG: ±6%	10 to 35 °C (50 to 95 °F) 1 kHz, at 4 or 5 DIV
Frequency bandwidth	DC - 2 MHz (-3 dB)	
Y-axis sensitivity	Same as CH2 vertical axis	
Sensitivity accuracy	Same as CH2 vertical axis	
Frequency bandwidth	Same as CH2 vertical axis	
X-Y phase difference	Within 3° (at DC - 100 kHz)	

Z axis

Item	Specification	Remarks
Sensitivity	3 Vp-p (Trace becomes brighter with negative input)	
Frequency bandwidth	DC - 5 MHz	
Input resistance	Approx. 5 kΩ	
Allowable input voltage	50 V peak (DC + AC peak)	AC frequency not higher than 1 kHz

Calibration voltage

Item	Specification	Remarks
Waveform	Positive-going square wave	
Frequency	1 kHz ±20%	
Output voltage	0.5 Vp-p, ±2%	
Output resistance	Approx. 500 Ω	

CRT

Item	Specification	Remarks
Type	6-inch rectangular type, internal graticule	
Phosphor	P31	
Acceleration voltage	Approx. 12 kV	
Effective screen size	8 × 10 DIV	1 DIV = 10 mm (0.39 in.)
Graticule	Internal graticule; continuously adjustable illumination	

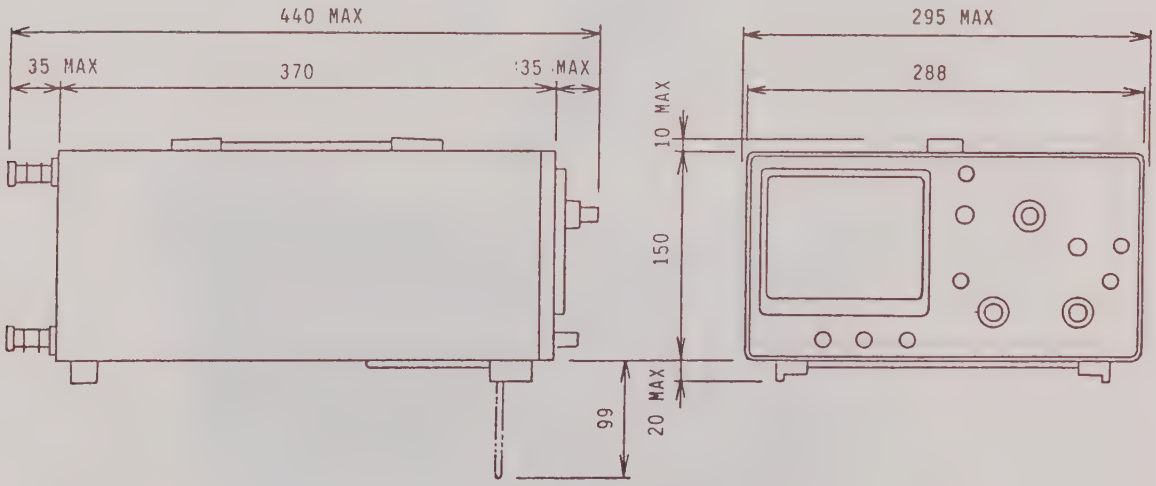
* FOR COS5020TM/COS5021TM/COS5040TM/COS5041TM

Line power requirements

Voltage	:	90 - 110 V, 104 - 125 V, 194 - 236 V, 207 - 250 V Selectable by connector change
Frequency	:	50 Hz or 60 Hz
Power consumption	:	Approx. 35 VA

Mechanical specifications

Mainframe dimension:		288 W × 150 H × 370 D mm (11.34 W × 5.91 H × 14.57 D in.)
Maximum dimensions	:	295 W × 180 H × 440 D mm (11.61 W × 7.07 H × 17.32 D in.)
Weight	:	Approx. 7.1 kg (16 lbs.)



Operating environment

To satisfy specifications:	5 to 35°C (41 to 95°F), 85% RH or less
Maximum operating ranges:	0 to 40°C (32 to 104°F), 90% RH or less

Accessories

P060-S probes (10:1, 1:1. 1.5 m)	2
942A terminal adaptors	2
Power cord	1
Instruction manual	1

- Specifications and contents on this manual are subject to change without notice.

3. MAINTENANCE

3.1 Preventive Maintenance

3.1-1 General description

The preventive maintenance means the cleaning of each section and visual inspection. The preventive maintenance at regular intervals will save the instrument from unexpected failures.

3.1-2 Removing case

Remove the seven screws (3 mm) and lift the case as shown in Fig. 3.1.

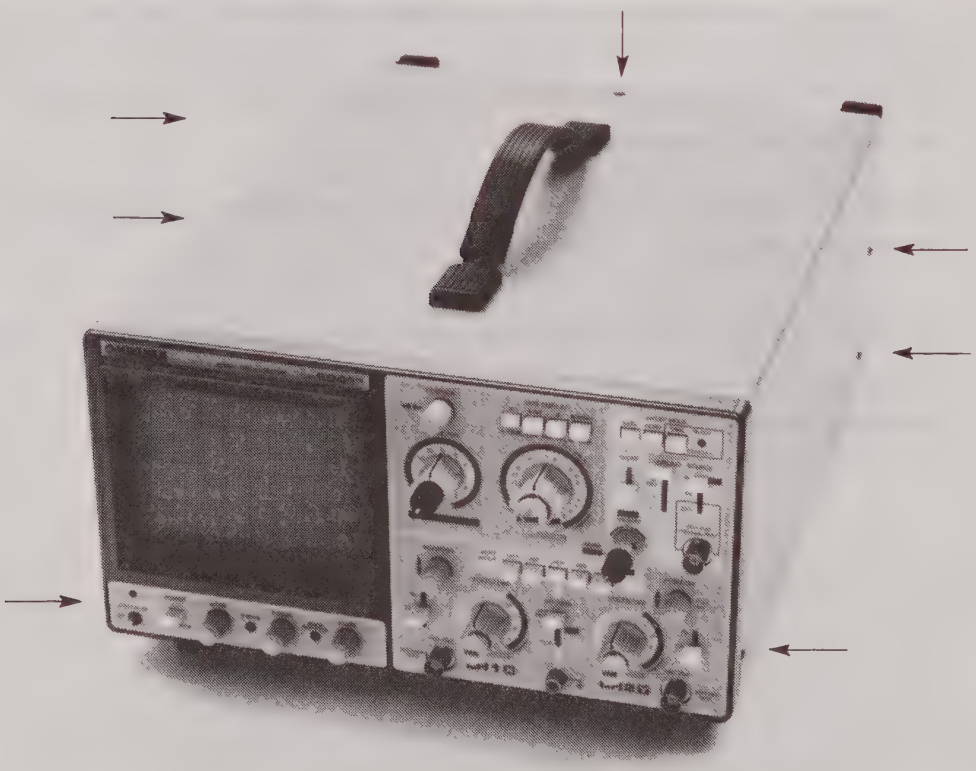


Fig. 3.1 Case Removing Method

3.1-3 Cleaning

Remove all the dust and dirt from inside of the instrument. Blow the dust by the dry air from an air compressor or absorb it with a vacuum cleaner. Especially, the dust or dirt stuck to the high voltage section must be removed completely because it may cause poor insulation. Also, clean the heat sink carefully because the dust or dirt in the heat sink will lower the heat radiation effect.

> CAUTION
>
> Do not wash the instrument with water or soapy water. If the dirt on the instrument, including its case and panel, cannot be removed by the air compressor or vaccum cleaner, wipe it off with a cloth dipped in Daiflon. Any part of the instrument, including the case and panel, must not be wiped with the volatile and active chemicals such as benzene, thinner, and toluene.

3.1-4 Inspecting semiconductors

Periodical inspection of the transistors and other semiconductors is not recommended for this model.

The best method of verifying the functions of the semiconductors is to run the instrument correctly and to see if the instrument operates correctly.

3.2 Verifying Function by Operation

3.2-1 General description

Section 3.2 explains the method of verifying the functions of the instrument by operating it. Each one of the subsections consists of the verification items. If the instrument does not operate correctly, readjust it according to the calibration procedure explained in Section 3.3 or repair it because the abnormal operation implies maladjustment or failure.

Table 3.1 lists the initial setting items required for the verification of the functions by operation. These initial setting items are common to COS5020TM, 5021TM, 5040TM, and 5041TM. For the oscilloscopes having delay function (COS5021TM and COS5041TM), the setting of the items listed in Table 3.2 is also required.

Table 3.1 Common Item Initial Setting

	FUNCTION	Setting	Remarks
Power supply	POWER	ON	
CRT section	INTEN	Enough brightness (60° to 90° clockwise from center position)	
	FOCUS	Set at best focus	
	ILLUM	Turn counterclockwise till stop	
Vertical axis section	Vertical sensitivity	5 mV/DIV (for both CH1 and CH2)	
	VARIABLE	CAL'D (for both CH1 and CH2)	
	PULL ×5MAG	OFF (for both CH1 and CH2)	
	Input coupling	DC (for both CH1 and CH2)	
	POSITION	Center (for both CH1 and CH2)	
	VERT MODE	CH1	
	CH2 INV	OFF	
Triggering section	INT TRIG	VERT MODE	
	SOURCE	INT	
	COUPLING	AC	
	SLOPE	+	
	LEVEL	LOCK (Turn counterclockwise till stop)	
	SWEEP MODE	AUTO	
Horizontal axis section	TIME/DIV	1 ms	A SWEEP
	VARIABLE	CAL'D	
	PULL ×10MAG	OFF	
	H POSITION	Center	
	HOLDOFF	Turn counterclockwise till stop	

Table 3.2 Delay Sweep Function Setting

	FUNCTION	Setting	Remarks
Horizontal axis section	HOR DISPLAY	A	
	B TIME/DIV	0.5 ms	B SWEEP
	DELAY TIME POSITION	Turn counterclockwise till stop	

3.2-2 Checking vertical axis operation

(1) Checking STEP balance

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 input coupling to GND, and confirm that the base line on CRT screen is shifted within the range of ±0.2 DIV when the vertical sensitivity is switched as follows: 5 mV/DIV → 10 mV/DIV → 20 mV/DIV → 50 mV/DIV.

3) Set VERT MODE to CH2.

4) Confirm that the base line for CH2 is also shifted within the range of ±0.2 DIV when the vertical sensitivity is switched in the same way as that for CH1.

(2) Checking ×5MAG balance

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 input coupling to GND, and pull and push the VARIABLE button for CH1 to turn on and off the ×5MAG function for CH1. Confirm that the base line on CRT screen is shifted within the range of ±1.0 DIV when the ×5MAG function is switched from ON to OFF and vice versa.

3) Set VERT MODE to CH2.

4) Confirm that the base line for CH2 is also shifted within the range of ±1.0 DIV when the ×5MAG function for CH2 is turned on and off.

(3) Checking DC balance

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 input coupling to GND, and turn VARIABLE for CH1 from the right maximum to left maximum. Confirm that the base line on CRT screen is shifted within the range of ±0.5 DIV when the VARIABLE is turned.

3) Set VERT MODE to CH2.

4) Confirm that the base line for CH2 is also shifted within the range of ±0.5 DIV when the VARIABLE for CH2 is turned in the same way as above.

(4) Checking ADD balance

1) Initialize the instrument according to Table 3.1.

2) Set VERT MODE to the dual channel mode (press both CH1 and CH2 buttons).

3) Set the base lines for CH1 and CH2 exactly at the center of the CRT screen (place one base line on the other).

4) Set VERT MODE to ADD, and see if the base line is shifted only within the range of ±0.5 DIV.

(5) Checking CH2 INV balance

1) Initialize the instrument according to Table 3.1.

2) Set VERT MODE to CH2 and CH2 input coupling to GND.

3) Place the base line at the center of the CRT screen by POSITION (CH2).

4) Turn on and off the INV function for CH2, and see if the base line is shifted only within the range of ±1 DIV.

(6) Checking vertical axis position

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 input coupling to GND, and turn POSITION (CH1) from right maximum to left maximum.
Confirm that the base line moves on the entire screen when the POSITION is turned.

3) Set VERT MODE to CH2.

4) Confirm that the base line for CH2 also moves on the entire screen.

(7) Checking vertical sensitivity (see Table 3.3)

1) Initialize the instrument according to Table 3.1.

2) Input an amplitude calibration signal from a vertical axis calibrator to CH1, and confirm that the sensitivity error for each range is within ±3% (±5% when the ×5MAG function is on).

3) Set VERT MODE to CH2.

4) Confirm that the sensitivity error for each range for CH2 is also within ±3% (±5% when the ×5MAG function is on).

Table 3.3 Vertical Sensitivity Error Ranges

Vertical axis	×5 MAG	Oscilloscope range	Vertical axis calibrator range	Oscilloscope CRT screen amplitude	Sensitivity error range
CH1 & CH2	OFF	5 mV/DIV	20 mV	4 DIV	±0.12 DIV
		10 mV/DIV	50 mV	5 DIV	±0.15 DIV
		20 mV/DIV	0.1 V	5 DIV	±0.15 DIV
		50 mV/DIV	0.2 V	4 DIV	±0.12 DIV
		0.1 V/DIV	0.5 V	5 DIV	±0.15 DIV
		0.2 V/DIV	1 V	5 DIV	±0.15 DIV
		0.5 V/DIV	2 V	4 DIV	±0.12 DIV
		1 V/DIV	5 V	5 DIV	±0.15 DIV
		2 V/DIV	10 V	5 DIV	±0.15 DIV
		5 V/DIV	20 V	4 DIV	±0.12 DIV
	ON	1 mV/DIV	5 mV	5 DIV	±0.25 DIV

(9) Checking vertical axis VARIABLE

1) Initialize the instrument according to Table 3.1.

2) Input an amplitude calibration signal of 20 mVp-p from a vertical axis calibrator to CH1. (The amplitude on CRT screen is 4 DIV.)

3) Turn the CH1 VARIABLE to the left maximum, and confirm that the amplitude on CRT screen is 1.6 DIV or less.

4) Set VERT MODE to CH2 to input the above signal to CH2.

5) Confirm that the amplitude on CRT screen is also 1.6 DIV or less when the CH2 VARIABLE is turned to the left maximum.

(10) Checking vertical axis low frequency characteristic

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 sensitivity to 10 mV/DIV.

3) Input a square waveform signal of approximately 1 kHz from a vertical axis calibrator to CH1, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 6 DIV.

4) Confirm that the flatness characteristic of the observed square waveform is 3% or less.

5) Set VERT MODE to CH2.

6) Set the CH2 sensitivity to 10 mV/DIV, and input the above signal to CH2.

7) Confirm that the flatness characteristic of the observed square waveform for CH2 is also 3% or less.

(11) Checking input attenuator (ATT) frequency characteristic

1) Initialize the instrument according to Table 3.1.

2) Input a square waveform signal of approximately 1 kHz from a vertical axis calibrator to CH1, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 5 DIV.

3) Confirm that the flatness characteristic of the observed square waveform is 3% or less.

4) Confirm that the flatness characteristic of the observed square waveform is 3% or less at each range.

5) Set VERT MODE to CH2.

6) Confirm that the flatness characteristic of the observed square waveform for CH2 is also 3% or less at each range.

(12) Checking vertical axis high frequency characteristic

1) Initialize the instrument according to Table 3.1.

2) Set the CH1 sensitivity to 10 mV/DIV.

3) Set TIME/DIV to 0.2 μs/DIV.

4) Input a square waveform signal of approximately 1 MHz from a vertical axis calibrator to CH1, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 5 DIV.

5) Confirm that the flatness characteristic of the observed square waveform is 5% or less.

6) Set VERT MODE to CH2, and the CH2 sensitivity to 10 mV/DIV.

7) Input the above signal to CH2, and confirm that the flatness characteristic of the observed square waveform for CH2 is also 5% or less.

3.2-3 Checking trigger operation

(1) Checking TRIG SOURCE

1) Initialize the instrument according to Table 3.1.

2) Set TIME/DIV to 10 μs/DIV.

3) Input a signal of 50 kHz from a signal generator to CH1, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 4 DIV.

4) Confirm that the waveform on CRT screen looks still without jitter.

5) Switch VERT MODE to CH2, and input the above signal to CH2.

6) Confirm that the waveform on CRT screen also looks still without jitter for CH2.

7) Switch TRIG SOURCE to LINE.

8) Set TIME/DIV ro 5 ms/DIV.

9) Input the LINE signal to CH1 or CH2.

10) Confirm that the waveform on CRT screen looks still without jitter.

11) Switch TRIG SOURCE to EXT.

12) Input a signal of 50 kHz from a signal generator to CH1 and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 4 DIV, as done in step 3).

13) Set TIME/DIV to 10 µs/DIV.

14) Apply the signal from "CH1 SIGNAL OUT" on rear panel to EXT input terminal.

15) Confirm that the waveform on CRT screen looks still without jitter, as done in step 4).

(2) Checking TRIG COUPLING

1) Initialize the instrument according to Table 3.1.

2) Input an amplitude calibration signal from a vertical axis calibrator to CH1, and adjust the signal so that the amplitude of the waveform observed on CRT screen becomes 2 DIV.

3) Release TRIG LEVEL from LEVEL LOCK, and turn the TRIG LEVEL dial till the waveform of the signal input to CH1 looks still without jitter on CRT screen. (The trigger level should be set at the middle of the waveform amplitude.)

4) Change the amplitude of the signal input to CH1 to 4 DIV, and confirm that the waveform on the CRT screen looks still because it is triggered correctly and that the trigger position has been shifted.

5) Switch TRIG COUPLING to DC.

6) Set the amplitude of the signal to 2 DIV.

7) Execute the same operation as step 3), and change the amplitude of the signal input to CH1 to 4 DIV. Then, confirm that the waveform on the CRT screen looks still because it is triggered correctly and that the trigger position has not been shifted.

8) Switch TRIG COUPLING to AC.

9) Input a signal of 1 MHz from a signal generator to CH1, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 4 DIV.

10) Set TIME/DIV to 1 μs/DIV.

11) Turn the TRIG LEVEL dial to give a trigger to the above signal.

12) Set TRIG COUPLING to HF REJ, and confirm that a trigger is not given to the above signal (because the trigger signal is attenuated).

13) Switch TRIG COUPLING to TV.

14) Apply a video signal of 4 DIV to the CH1 input terminal.

15) Set TRIG SLOPE to "-".

16) Confirm that the TV.V signal is observed when TIME/DIV is in the low speed range of 0.1 or more ms/DIV and that the TV.H signal is observed when TIME/DIV is in the high speed range of 50 or more s/DIV.

(3) Checking TRIG SLOPE

1) Initialize the instrument according to Table 3.1.

2) Input an amplitude calibration signal of 20 mVp-p from a vertical axis calibrator to CH1.

3) Release TRIG LEVEL from LEVEL LOCK, and turn the TRIG LEVEL dial till the waveform of the signal input to CH1 looks still without jitter on CRT screen. (The trigger level should be set at the middle of the waveform amplitude.)

4) Confirm that the waveform on the CRT screen is triggered correctly at the plus (+) slope.

5) Set TRIG SLOPE to "-".

6) Confirm that the waveform on the CRT screen is triggered correctly at the minus (-) slope.

(4) Checking SWEEP MODE

1) Initialize the instrument according to Table 3.1.

2) Input a signal of 50 kHz to CH1 from a signal generator, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 4 DIV.

3) Set TIME/DIV to 10 μs/DIV.

4) Release TRIG LEVEL from LEVEL LOCK, and turn the TRIG LEVEL dial slowly clockwise. Confirm that the waveform in FREE RUN state starts being triggered at the minus (-) peak and the trigger position moves to reach the plus (+) peak as the dial is turned. Also confirm that the waveform returns to the FREE RUN state when the dial is turned further.

5) Set the CH1 input coupling to GND, and confirm that the signal waveform disappears from the screen, leaving only one base line.

6) Set SWEEP MODE to NORM, and turn the TRIG LEVEL dial counterclockwise up to the maximum (immediately before LEVEL LOCK).

7) Turn the TRIG LEVEL dial clockwise, and confirm that a waveform appears on the CRT screen and starts being triggered at the minus (-) peak. Also confirm that the trigger position moves to reach the plus (+) peak and the waveform disappears from the screen when the dial is turned further.

8) Set the CH1 input coupling to GND when the signal is triggered, and confirm that the base line and waveform disappear from the screen.

9) Switch the CH1 input coupling back to DC, and trigger the signal by turning the TRIG LEVEL dial.

10) Set SWEEP MODE to SINGLE.

11) Set TIME/DIV to 1 s/DIV.

12) Set the CH1 input coupling to GND, and press SINGLE. (PUSH TO RESET).

13) Confirm that the LED at the upper right side of the SINGLE switch is turned on to indicate that the instrument has entered the single sweep wait mode.

14) Set the CH1 input coupling back to DC.

15) Confirm that a signal is input and triggered and that a single sweep is observed.

3.2-4 Checking horizontal axis operation

(1) Verifying horizontal axis sensitivity (for X-Y)

1) Initialize the instrument according to Table 3.1.
2) Set TIME/DIV to "X-Y or EXT HOR".
3) Set TRIG SOURCE to INT.
4) Set TRIG COUPLING to DC.
5) Set VERT MODE to CH2 (X-Y).
6) Set INT TRIG to CH1 (X-Y).
7) Apply an amplitude calibration signal of 1 Vp-p from a vertical axis calibrator to the EXT input terminal.
8) Confirm that the horizontal length of the waveform on the CRT screen is about 10 DIV ±20%.
9) Set TRIG SOURCE to CH1 (X-Y).
10) Set the CH1 input sensitivity to 10 mV/DIV.
11) Apply an amplitude calibration signal of 100 mVp-p from a vertical axis calibrator to the CH1 input terminal.
12) Confirm that the horizontal length of the waveform on CRT screen is 10.0 ±0.4 DIV.

(2) Checking horizontal position

1) Initialize the instrument according to Table 3.1.
2) Apply the signal from a time mark generator set at 1 ms to the CH1 input terminal, and adjust the sensitivity of the oscilloscope till the amplitude of the waveform observed on CRT screen becomes 2 DIV.
3) Turn the horizontal position dial so that the sweep starts from the left edge of the CRT screen scale.
4) Switch TIME/DIV to "X-Y or EXT HOR", and confirm that a luminant mark is observed within ±1 DIV from the center of the CRT screen.

(3) Checking horizontal axis phase and frequency characteristics (for X-Y)

1) Initialize the instrument according to Table 3.1.
2) Set TIME/DIV to "X-Y or EXT HOR".
3) Set TRIG SOURCE to EXT.
4) Set TRIG COUPLING to DC.
5) Set VERT MODE to CH2 (X-Y).
6) Set INT TRIG to CH1 (X-Y).
7) Set the CH1 input sensitivity to 0.1 V/DIV.
8) Apply a signal of 10 kHz and 0.8 Vp-p from a signal generator to the "EXT" and EXT input terminals.
9) Gradually increase the signal generator frequency, and confirm that the phase difference is within ±3° when the frequency is within 50 kHz.
10) Set TRIG SOURCE to INT (X-Y).
11) Set the CH1 input sensitivity to 0.1 V/DIV.
12) Apply a signal of 10 kHz and 0.8 Vp-p from a signal generator to the CH1 and CH2 input terminals.
13) As in step 9), gradually increase the signal generator frequency and confirm that the phase difference is within ±3° when the frequency is within 50 kHz.
14) Apply a signal of 50 kHz from the signal generator to only CH1, and adjust the signal till the amplitude on the CRT screen becomes 10 DIV.
15) Gradually increase the signal generator frequency, and confirm that the horizontal direction frequency characteristic is within -3 dB when the frequency is 2 MHz.

3.2-5 Checking time axis operation

(1) Verifying SWEEP TIMING

1) Initialize the instrument according to Table 3.1.
2) Apply a signal from a time mark generator to the CH1 input terminal, and switch the oscilloscope sensitivity till the amplitude of the waveform on CRT screen becomes approximately 2 DIV.
3) Switch TIME/DIV and the time mark generator oscillation ranges, and confirm that the error for each sweep range is within ±3%.
4) Pull the PULL ×10MAG knob, and confirm that the sweep time error for each range is within ±5% (the sweep time error for the 0.5 μs/DIV range may be within ±8%).

(2) Checking SWEEP VARIABLE

1) Initialize the instrument according to Table 3.1.
2) Apply a signal from a time mark generator set at 10 ms to the CH1 input terminal, and adjust the oscilloscope input sensitivity till the amplitude of the waveform on the CRT screen becomes approximately 2 DIV.
3) Turn the SWEEP VARIABLE dial counterclockwise to the maximum position, and confirm that the sweep time at the maximum position is 2.5 times as long as that at the initial position.

(3) Checking HOR DISPLAY operation (for COS5021TM/5041TM only)

1) Initialize the oscilloscope according to Tables 3.1 and 3.2.
2) Apply a signal from a time mark generator set at 0.5 ms to the CH1 input terminal, and adjust the oscilloscope input sensitivity till the amplitude of the waveform on CRT screen becomes approximately 2 DIV.
3) Set HOR DISPLAY to A INT.

4) About 70% of the waveform from the left edge is displayed brightly as a dealy sweep portion, and the portion moves to the right continuously as the DELAY TIME POSITION dial is turned clockwise.

5) Set HOR DISPLAY to B.

6) Confirm that the delay sweep portion is magnified twice.

7) Turn the DELAY TIME POSITION dial counterclockwise to the maximum.

8) Set HOR DISPLAY to A INT, and turn on B TRIG'D.

9) Turn the DELAY TIME POSITION dial clockwise, and confirm that the bright delay sweep portion on the screen is shifted for each marker position.

(4) Checking DELAY TIME (for COS5021TM/5041TM only)

1) Initialize the oscilloscope according to Tables 3.1 and 3.2.

2) Apply a signal from a time mark generator set at 0.5 ms to the CH1 input terminal, and adjust the oscilloscope input sensitivity till the amplitude of the waveform on CRT screen becomes approximately 2 DIV.

3) Set HOR DISPLAY to B.

4) Turn on B TIRG'D.

5) Switch B TIME/DIV and time mark generator oscillation ranges, and confirm that the error for each sweep time is within ±3%.

6) Pull the PULL ×10MAG knob, and confirm that the error for each sweep time is within ±5% (±8% for the 0.5 µs/DIV range).

3.3 Calibration

3.3-1 General description

The oscilloscope need be calibrated periodically. The parts used in the oscilloscope change little in one year (normal calibration interval), but if the oscilloscope is not calibrated for a long time, the little change may accumulate and cause the oscilloscope not to satisfy its specifications. Also, a failure of the function that has not been used may be found by the periodical calibration.

Since the oscilloscope is a measuring instrument, it is like a scale. So, the data obtained by it must be always correct.

To calibrate the oscilloscope, use correctly calibrated calibrators, and the line voltage to be applied to the calbrators must be selected carefully.

The line voltage to be applied to the oscilloscope during its calibration must be within ±2% of the standard line voltage (100 V, 115 V, 215 V, or 230 V), and the line frequency must be within the range from 48 Hz to 62 Hz.

3.3-2 Measuring instruments for calibration

Table 3.4 list the measuring instruments required for the calibration of the oscilloscope.

Table 3.4 Measuring Instruments for Calibration

Measuring Instrument		Performance	Remarks
Digital voltmeter (1) (low voltage)		Measurement range : 0~500 V Accuracy : Within ±0.1%	To check internal power source
Digital voltmeter (2) (high voltage)		Measurement range : 0~10 kV Accuracy : Within ±1%	To check acceleration voltage
Capacity meter		Measurement range: 0~50 pF Accuracy : Within ±3%	To check input capacitance
Vertical axis calibrator	Amplitude calibration	Output voltage : 1 mVp-p to 50 Vp-p Accuracy : Within ±3%	Used for vertical axis X-Y amplitude calibration Square waveform (approx. 1 kHz)
	Square waveform quality calibration	Output waveform: Square Frequency : 10 Hz to 1 MHz Rising time : 1.0 ns or less Flatness : Within ±0.5%	To adjust square waveform flatness
Time mark generator		Mark output: 5 s to 2 ns Stability : Within ±0.1%	To calibrate time axis
Signal generator		Frequency range : 250 kHz to 100 MHz Frequency accuracy : Within ±1% Output voltage : 5 mVp-p to 5.5 Vp-p Flatness : Within ±2%	Used for vertical axis and X-Y frequency calibration 50 kHz standard
Connection cable		Characteristic impedance : 50Ω Length : Approx. 1 m	To or more cables
Terminator		Characteristic impedance : 50Ω Power : 1/2 W or more	Two terminators
Attenuator		Characteristics impedance : 50Ω Power : 1/2 W or more	
Screwdriver		For 3 mm screws	
Screwdriver for adjustment		For small capacitance	

3.3-3 PC board allocation

Table 3.5 lists the PC boards used in the oscilloscope, and Fig. 3.2 shows their allocation diagram.

Table 3.5 PC Boards

Name	Remarks
A1 VERT & P.SUPPLY (COS50××TM)	
A2 SWEEP & H.V (COS50××TM)	
A3 SWEEP MODE SWITCH (COS50××TM)	
A4 CAL & CRT CONTROL (COS50××TM)	Below CRT
A5 VERT MODE SWITCH (COS50××TM)	
A6 CRT CONNECTOR (COS50××TM)	With CRT socket
A7 H.V UNIT (COS50××TM)	Mounted on A2
A8 EXCANGE UNIT (COS50××TM)	

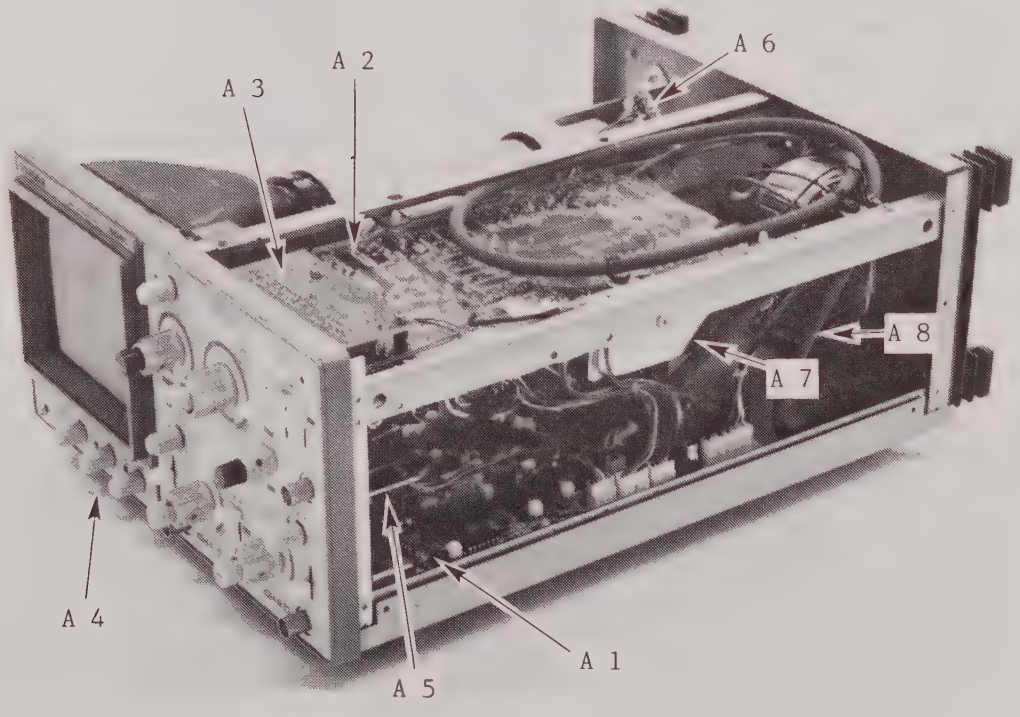


Fig. 3.2 PC Board Allocation

3.3-4 Calibration procedure

The oscilloscope must be calibrated efficiently in the same porcedure as it was produced.

Since this section explains the procedure to calibrate the oscilloscope most quickly and accurately, be sure to follow the procedure when calibrating it.

If all the items need not be calibrated, the calibration may be started from a desired item, but before starting the calibration of that item, be sure to complete (1) adjustment and verification of internal voltages and (2) adjustment of CRT circuits.

(1) Initial setting

Table 3.6 lists the initial setting items for the controls and switches on panel common to COS5020TM, 5021TM, 5040TM, and 5041TM. The oscilloscopes having delay function (COS5021TM and 5041TM) require the setting of the items listed in Table 3.6 also.

Table 3.6 Common Item Initial Setting

Function		Setting	Remarks
Power supply	POWER	ON	
CRT section	INTEN	Enough brightness (60° to 90° clockwise from center position)	
	FOCUS	Set at best focus	
	ILLUM	Turn counterclockwise till stop (MIN)	
Vertical axis section	Vertical sensitivity	10 mV/DIV (for both CH1 and CH2)	
	VARIABLE	CAL'D (for both CH1 and CH2)	
	PULL ×5MAG	OFF (for both CH1 and CH2)	
	Input coupling	DC (for both CH1 and CH2)	
	POSITION	Center (for both CH1 and CH2)	
	VERT MODE	CH1	
	CH2 INV	OFF	
Triggering section	INT TRIG	VERT MODE	
	SOURCE	INT	
	COUPLING	AC	
	SLOPE	+	
	LEVEL	LOCK (Turn counterclockwise till stop)	
	SWEEP MODE	AUTO	
Horizontal axis section	TIME/DIV	1 ms	A SWEEP
	VARIABLE	CAL'D	
	PULL ×10MAG	OFF	
	H POSITION	Center	
	HOLDOFF	Turn counterclockwise till stop (MIN)	
(FOR COS5021TM COS5041TM)	HOR DISPLAY	A	
	B TIME/DIV	1 μs	B SWEEP
	DELAY TIME POSITION	Counter counterclockwise till stop	

(2) Adjustment and verification of internal voltages

First, check the +12 V power source built in the oscilloscope because it is used as the reference power source. If the voltage of the +12 V power source is not within the range shown in Table 3.7, adjust +12 V ADJ (RV606) on the A1 board. Other power sources should be checked but need not be adjusted. Table 3.7 lists the voltage ranges allowed to power sources. Fig. 3.3 shows the power source voltage adjustment and verification positions.

Table 3.7 Power Source Voltages

DC Power Source	Voltage Range	Adjustment/verification position	Remarks
+5 V	+4.75 V ~ +5.25 V	See Fig. 3.3	COS5020TM/5021TM 5040TM/5041TM
+12 V	+11.95 V ~ +12.05 V	RV606	
-12 V	-11.80 V ~ +12.20 V	See Fig. 3.3	
+160 V	+155 V ~ +165 V	See Fig. 3.3	COS5020TM/5021TM
-2100 V	-2050 V ~ -2150 V		
+145 V	+140 V ~ +150 V	See Fig. 3.3	COS5040TM/5041TM
-1800 V	-1750 V ~ -1850 V		

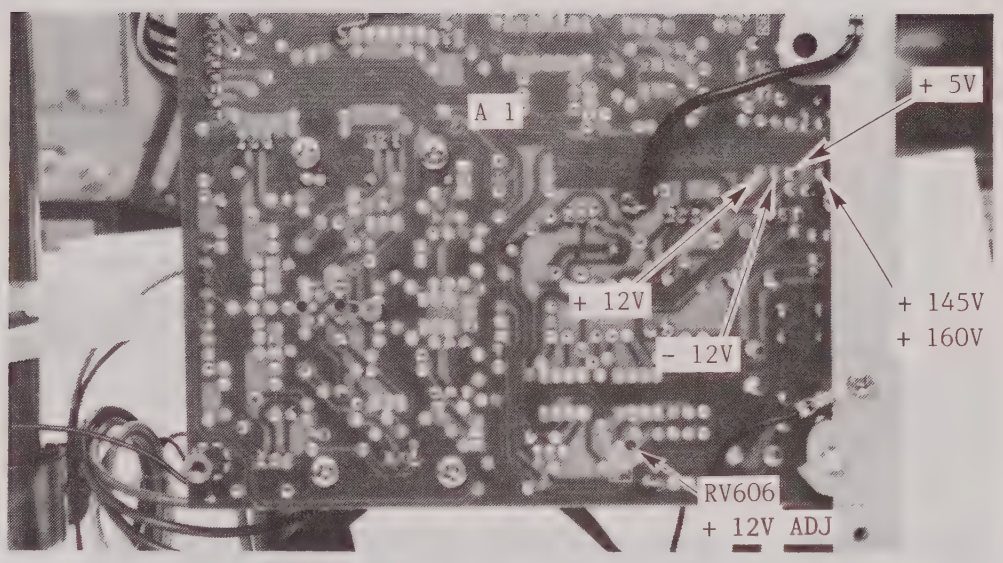


Fig. 3.3 Power Source Voltage Adjustment and Verification Position

(3) Adjustment of CRT circuits

> CAUTION
>
> The adjustment of CRT circuits affects the CRT deflection sensitivity as the adjustment of internal voltages does. So, after adjusting the CRT section, be sure to check the vertical sensitivity and sweep time.

(a) Adjustment of SUB INTEN

Adjust the INTEN position and brightness of base line.

1) Set TIME/DIV to 1 ms/DIV, and draw one horizontal base line on CRT screen.
2) Set the white dot of the INTEN dial to the position of 10 o'clock, and confirm that the base line can be seen faintly. If the base line looks too bright or cannot be seen at all, adjust the SUB INTEN control (RV653) on the A2 board shown in Fig. 3.4.

(b) Adjustment of SUB FOCUS

Adjust the FOCUS dial position.
Set the white dot of the FOCUS dial at the position of 12 o'clock and confirm that the best focus is obtained. If the best focus is not obtained when the white dot is at the position of 12 o'clock, adjust the SUB FOCUS control (RV651) on the A2 board shown in Fig. 3.4.

(c) Adjustment of ASTIG

Adjust the astigmatism of the electron lens in the CRT.

1) Set TIME/DIV to X-Y or EXT HOR, and display a beam spot in the center of the CRT screen with the horizontal and vertical POSITION controls.
2) Turn the FOCUS dial to an appropriate position, and see if the beam spot becomes a true circle. If the beam spot does not become a true circle by the turning of the FOCUS dial, adjust the ASTIG control (RV652) on the A2 board shown in Fig. 3.4.

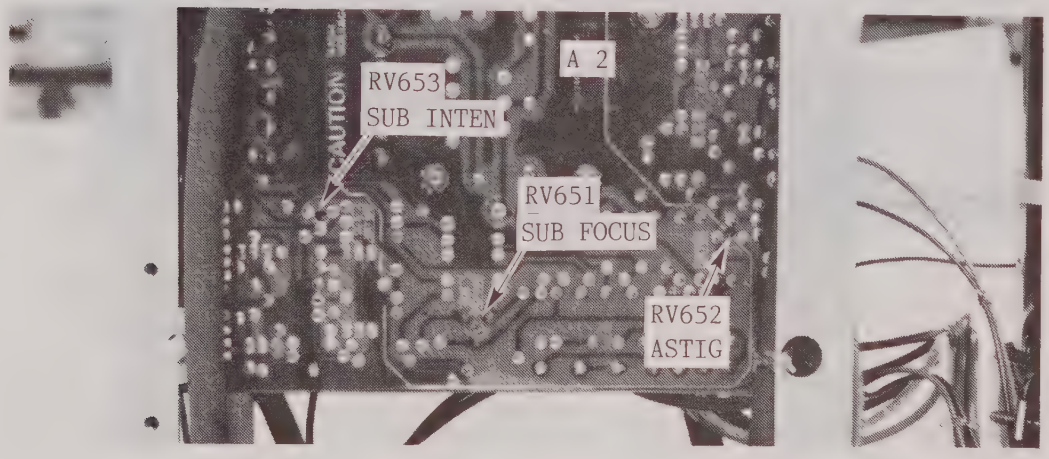


Fig. 3.4 CRT Circuit Adjustment Position

(4) Adjustment of vertical axis

(a) STEP BAL

Use the STEP BAL control for minimizing the shift of trace when the vertical sensitivity is changed.

1) Initialize the oscilloscope according to Table 3.6.
2) Set the CH1 input coupling to GND, and confirm that the base line on CRT screen may be shifted only within the range of ±0.2 DIV when the vertical sensitivity is switched as follows:

10 mV 20 mV 50 mV/DIV

If the base line is shifted more than ±0.2 DIV, adjust the CH1 STEP BAL control (RV101) on the A1 board in Fig. 3.5.
3) Set VERT MODE to CH2, and CH2 input coupling to GND.
4) Confirm that the base line for CH2 is also shifted within the range of ±0.2 DIV when the vertical sensitivity is switched in the same way as that for CH1.
If the base line is shifted more than ±0.2 DIV, adjust the CH2 STEP BAL control (RV201) on the A1 board in Fig. 3.5.

(b) ×5MAG balance

This control is for minimizing the shift of trace caused by the use of ×5MAG function for vertical sensitivity.

1) Initialize the oscilloscope according to Table 3.6.
2) Set the CH1 input coupling to GND, and turn on and off the ×5MAG (CH1) switch. Confirm that the trace (base line) may be shifted only within the range of ±1.0 DIV when the switch is set from ON to OFF and vice versa.
If the trace on the CRT screen is shifted more than ±1.0 DIV, adjust the CH1 MAG DC BAL control (RV112) on the A1 board in Fig. 3.5.
3) Set VERT MODE to CH2, and CH2 input coupling to GND.

4) Confirm that the trace for CH2 may also be shifted within the range of ±1.0 DIV when the ×5MAG (CH2) switch is turned on/off.
If the trace for CH2 is shifted more than ±1.0 DIV, adjust the CH2 MAG DC BAL control (RV212) on the A1 board in Fig. 3.5.

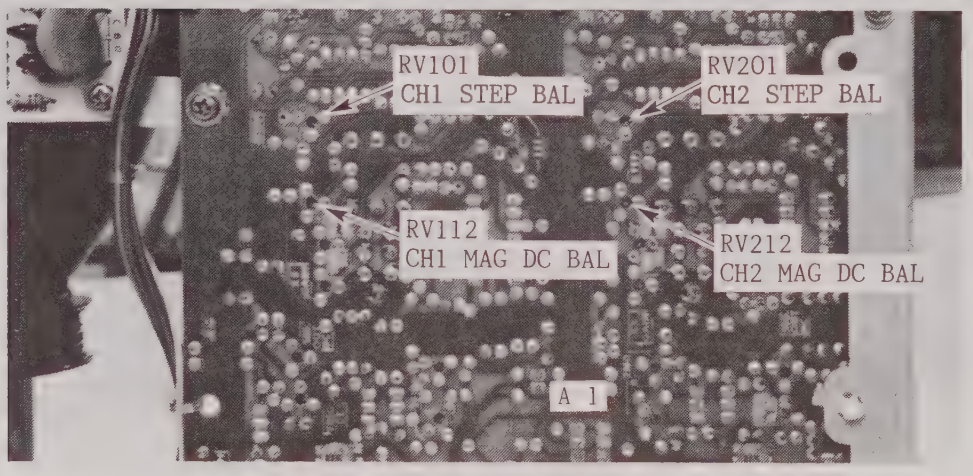


Fig. 3.5 CH1/CH2 STEP BAL (RV201/RV202) and CH1/CH2 MAG DC BAL (RV112/RV212) Adjustment Positions

(c) DC balance

This control is for minimizing the shift of trace caused by the turning of the VARIABLE knob.

1) Initialize the oscilloscope according to Table 3.6.
2) Set the CH1 input coupling to GND. Turn the VARIABLE knob from the right maximum to the left maximum, and confirm that the trace on the CRT screen may be shifted within the range of ±0.5 DIV.
   If the trace is shifted more than ±0.5 DIV, adjust the CH1 VAR DC BAL control (RV105) on the A1 board in Fig. 3.6.
3) Set VERT MODE to CH2, and CH2 input coupling to GND.
4) Confirm that the trace for CH2 may also be shifted within the range of ±0.5 DIV when the VARIABLE knob is turned in the same way as above.
   If the trace is shifted more than ±0.5 DIV, adjust the CH2 VAR DC BAL control (RV205) on the A1 board in Fig. 3.6.

(d) Vertical axis sensitivity calibration

Calibrate the values on panel to actual sensitivity.

1) Initialize the oscilloscope according to Table 3.6.
2) Set TIME/DIV to 1 ms/DIV.
3) Apply an amplitude calibration signal from a vertical axis calibrator set at 50 mVp-p to the CH1 input terminal, and confirm that the sensitivity error for the 10 mV/DIV range is within ±3%.
   If the sensitivity error is not within ±3%, adjust the CH1 GAIN control (RV110) on the A1 board in Fig. 3.6.
4) Set VERT MODE to CH2.

5) Apply the amplitude calibration signal to the CH2 input terminal, and confirm that the sensitivity error for the 10 mV/DIV range is also within ±3%.
If the sensitivity error is not within ±3%, adjust the CH2 GAIN control (RV210) on the A1 board in Fig. 3.6.

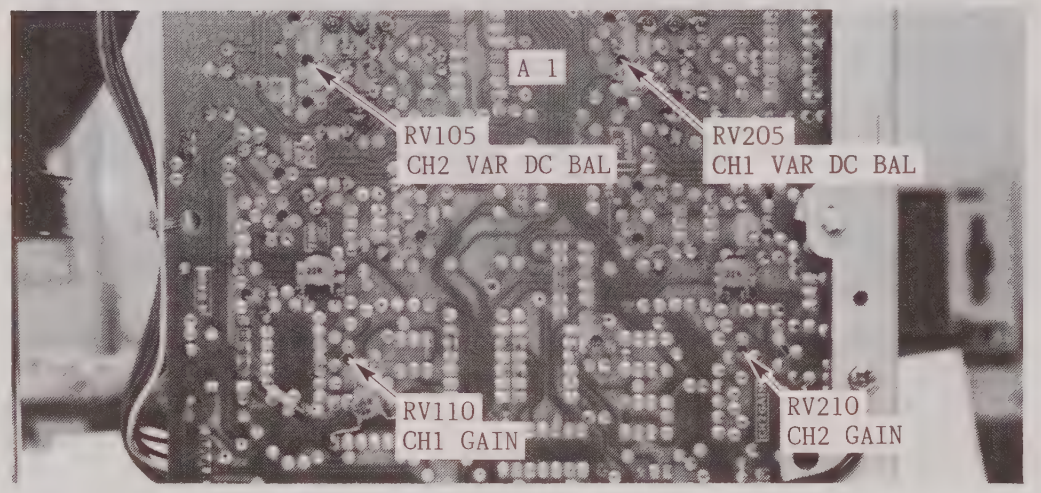


Fig. 3.6 CH1/CH2 VAR DC BAL (RV105/RV205) and CH1/CH2 GAIN (RV110/RV210) Adjustment Positions

(e) ×5MAG sensitivity calibration

Calibrate the ×5MAG setting to the actual sensitivity.

1) Initialize the oscilloscope according to Table 3.6.
2) Set the CH1 input range to 50 mV, and turn on the ×5MAG switch for CH1.
3) Apply an amplitude calibration signal from a vertical axis calibrator set at 50 mVp-p to the CH1 input terminal (open-circuit termination), and confirm that the CH1 sensitivity error is within ±5%
   If the sensitivity error is not within ±5%, adjust the CH1 ×5 GAIN control (RV102) on the A1 board shown in Fig. 3.7.
4) Set VERT MODE to CH2, and apply the above signal to CH2.
5) Confirm that the CH2 sensitivity error is also within ±5% when the ×5MAG switch is on.
   If the sensitivity error is not within ±5%, adjust the CH2 ×5 GAIN control (RV202) on the A1 board shown in Fig. 3.7.

(f) ADD BAL

This control is for matching the DC BAL of CH1 to that of CH2 in ADD mode.

1) Initialize the oscilloscope according to Table 3.6.
2) Set VERT MODE to the dual channel mode (press both CH1 and CH2 buttons).
3) Set the base lines for CH1 and CH2 exactly at the center of the CRT screen (place one base line on the other).
4) Set VERT MODE to ADD, and confirm that the base line may be shifted only within the range of ±0.5 DIV.
   If the base line is shifted beyond the range of ±0.5 DIV, adjust the ADD BAL control (RV301) on the A1 board shown in Fig. 3.7.

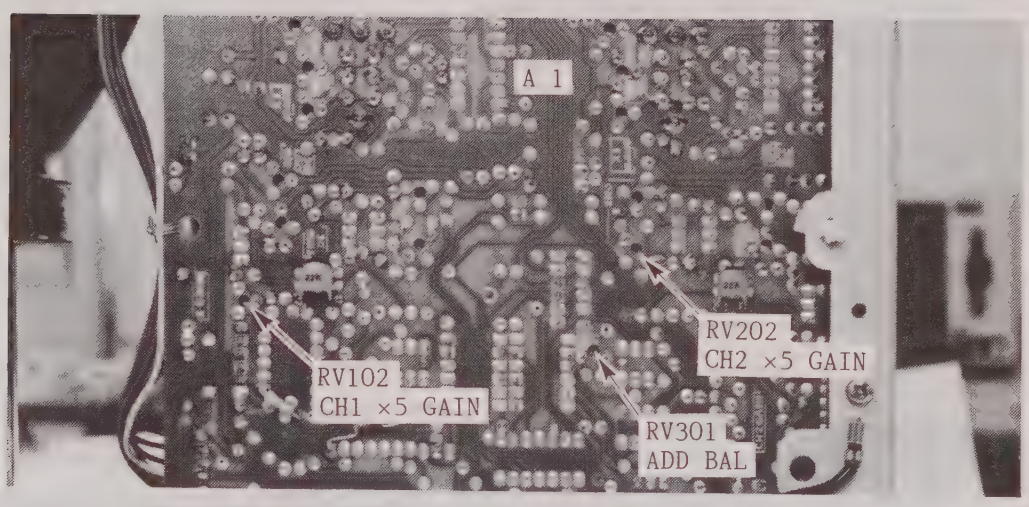


Fig. 3.7 CH1/CH2 ×5 GAIN (RV102/RV202) and ADD BAL (RV301) Adjustment Positions

(g) Square waveform characteristic of vertical axis amplifier (middle range)

Adjust the vertical axis amplifier so that it will output a highly flat middle range square waveform.

1) Initialize the oscilloscope according to Table 3.6.

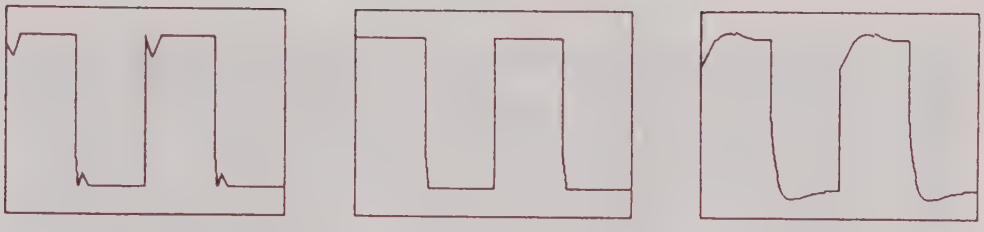
2) Set TIME/DIV to 0.2 μs/DIV.

3) Apply a high grade square waveform signal of about 1 MHz from a vertical axis calibrator to the CH1 input terminal (50 Ω termination), and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 6 DIV.

4) Confirm that the flatness characteristic of the observed square waveform is as shown in chart (II) of Fig. 3.8. If the flatness characteristic as shown in chart (II) is not observed on the CRT screen, adjust the COMP(M) ADJ controls (RV302 and C33) and CH1 COMP(M) ADJ controls (RV109 and C171) alternately to obtain the maximum flatness characteristic. The controls are found on the A1 board shown in Fig. 3.9.

5) Set VERT MODE to CH2, and apply the above signal to the CH2 input terminal.

6) Confirm that the square waveform obtained through CH2 also has the flatness characteristic shown in chart (II) of Fig. 3.8. If it does not have the flatness characteristic shown in chart (II), adjust the CH2 COMP(M) ADJ controls (RV209 and C271) to obtain the maximum flatness characteristic. The controls are found on the A1 board shown in Fig. 3.9.



(I) Not good (II) Good (III) Not good

Fig. 3.8 Square Waveform Flatness Adjustment (Middle Range)

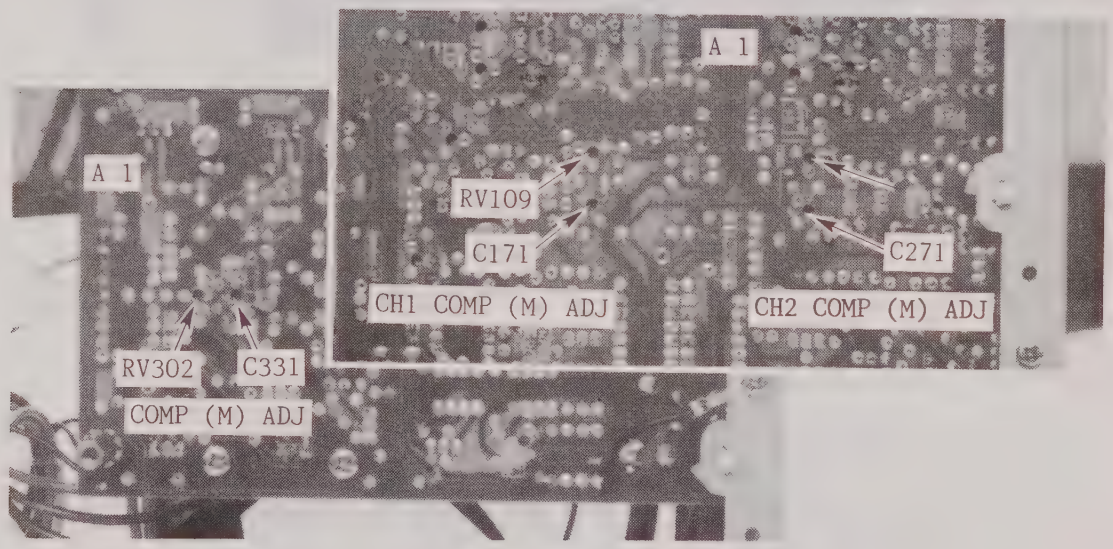


Fig. 3.9 Vertical Axis Amplifier Square Waveform Characteristic (Middle Range) adjustment positions

(h) Square waveform characteristic of vertical axis amplifier (high range)

1) Initialize the oscilloscope according to Table 3.6.

2) Set TIME/DIV to 0.2 μs/DIV.

3) Apply a high grade square waveform signal of about 1 MHz from a vertical axis calibrator to the CH1 input terminal (50 Ω termination), and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 6 DIV.

4) Confirm the flatness of the observed square waveform, especially that around the leading or trailing edges.
If the observed square waveform does not have a good flatness characteristic especially around the leading or trailing edges, adjust the CH1 COMP(H) ADJ controls (RV103 and C131) alternately to obtain the maximum flatness characteristic. The controls are found on the A1 board shown in Fig. 3.10.

5) Set VERT MODE to CH2, and apply the above signal to the CH2 input terminal.

6) Confirm that the square waveform through CH2 also ha a good flatness characteristic especially around the leading or trailing edges.
If it does not have a good flatness characteristic, adjust the CH2 COMP(H) ADJ controls (RV203 and C231) alternately to obtain the maximum flatness characteristic. The controls are found on the A1 board shown in Fig. 3.10.

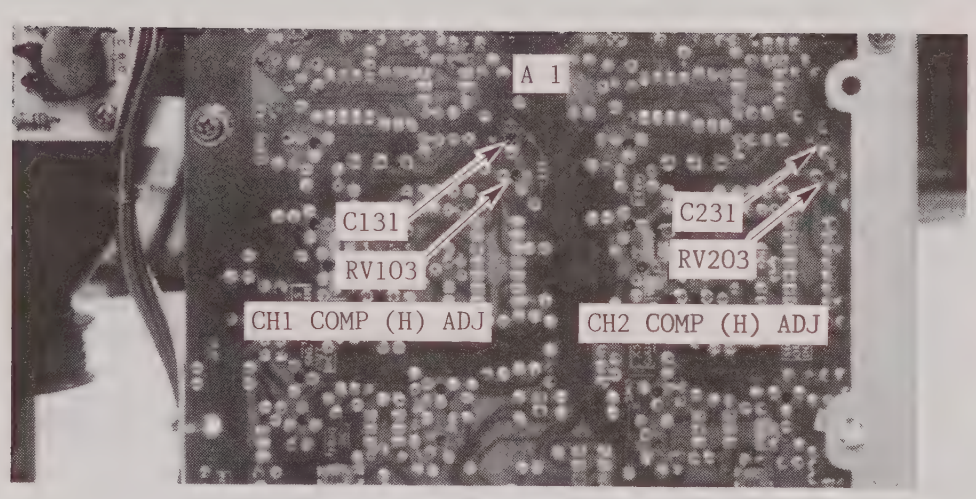


Fig. 3.10 Vertical Axis Amplifier Square Waveform Characteristic (High Range) Adjustment Positions

(i) Input attenuator (ATT)

Calibrate the phase compensation and input capacitance of the input attenuator.

1) Initialize the oscilloscope according to Table 3.6.

2) Apply a high rade square waveform signal of about 1 kHz from a vertical axis calibrator to the CH1 input terminal (50Ω termination), and set TIME/DIV of the oscilloscope to 0.5 ms/DIV.

3) Set the amplitude of the square waveform observed on the CRT screen to 6 DIV for each one of the CH1 ranges listed in Table 3.10, and confirm that the square waveform flatness characteristic is within ±3%.
If the flatness is not within ±3% adjust the CH1 phase compensation controls (C103 and C106) on the A1 board shown in Fig. 3.11.

4) Set VERT MODE to CH2, and apply the above signal to the CH2 input terminal.

5) Set the amplitude of the square waveform observed on the CRT screen to 6 DIV for each one of the CH2 ranges listed in Table 3.10, and confirm that the square waveform flatness characteristic is within ±3%.
If the flatness is not within ±3%, adjust the CH2 phase compensation controls (C203 and C306) on the A1 board shown in Fig. 3.11.

6) Connect a capacity meter to the CH1 input terminal.

7) Confirm that the input capacitance for each one of the CH1 ranges listed in Table 3.10 is 25 pF ±2 pF.
If the input capacitance is not 25 pF ±2 pF, adjust the CH1 input capacitance controls (C102 and C105) on the A1 board shown in Fig. 2.11.

8) Connect the capacity meter to the CH2 input terminal.

9) Confirm that the input capacitance for each one of the CH2 ranges listed in Table 3.10 is 25 pF ± 2 pF.
If the input capacitance is not 25 pF ±2 pF, adjust the CH2 input capacitance controls (C202 and C205) on the A1 board shown in Fig. 3.11.

Table 3.8 Input Attenuator (ATT) Adjustment

	CH1		CH2	
	Phase Compensation	Input capacitance	Phase Compensation	Input capacitance
0.1V RANGE	C103	C102	C203	C202
1V RANGE	C106	C105	C206	C205

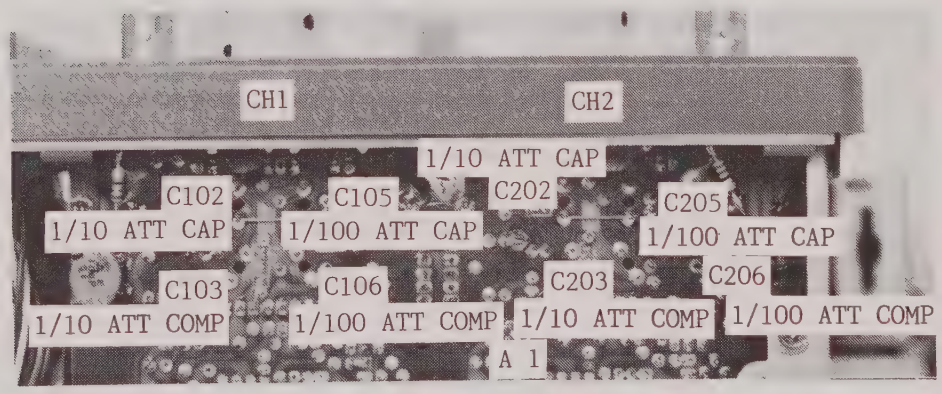


Fig. 3.11 Input Attenuator (ATT) Adjustment Positions

(j) CH1 SIGNAL OUTPUT DC OFFSET

Set the DC offset of CH1 SIGNAL OUTPUT to zero.

> CAUTION
>
> This adjustment must be done after the adjustment of INT TRIG DC OFFSET for CH1 explained in Section (5) "Adjustment of trigger circuit".

1) Initialize the oscilloscope according to Table 3.6.

2) Set the CH1 input coupling to GND, and connect the CH1 SIGNAL OUTPUT terminal to the CH2 input terminal by a coaxial cable (50 Ω termination).

3) Set VERT MODE to CH2.

4) Confirm that the trace on the CRT screen may be shifted within the range of 1 DIV when the CH2 input coupling is switched as follows: DC → GND → DC.
If the trace is shifted beyond the range of 1 DIV, adjust the CH1 SIGNAL OUTPUT DC OFFSET control (RV108) on the A1 board in Fig. 3.12.

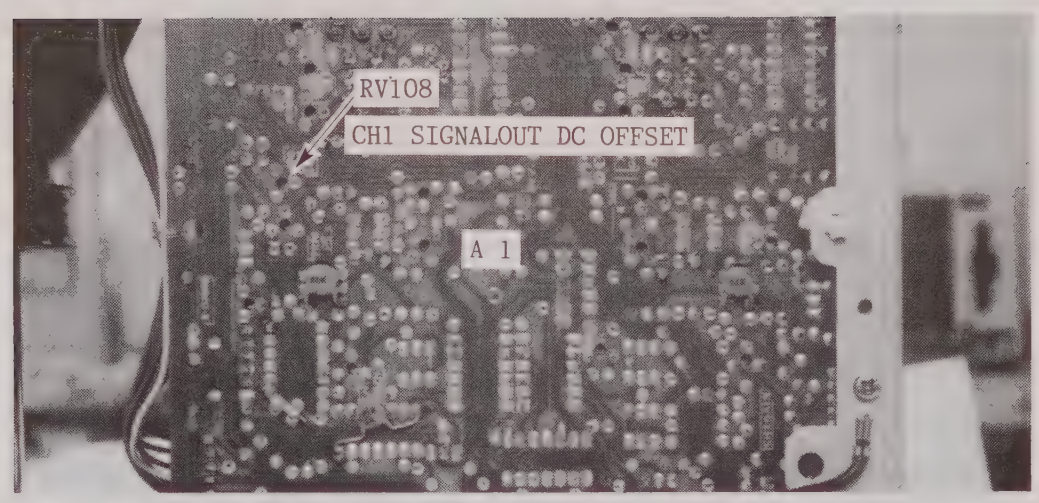


Fig. 3.12 CH1 SIGNAL OUTPUT DC OFFSET (RV108) Adjustment Position

(5) Adjustment of Trigger Circuit

TRIG DC OFFSET

Set the DC OFFSET of INT TRIG (CH1/CH2) to zero.

1) Initialize the oscilloscope according to Table 3.6.

2) Set the CH1 input coupling to AC.

3) Apply a signal of about 50 kHz from a signal generator to the CH1 input terminal, and adjust the signal till the amplitude of the waveform observed on CRT screen becomes 8 DIV.

4) Set TIME/DIV to 5 μs/DIV.

5) Adjust TRIG LEVEL to set the trigger point at the middle of the observed waveform amplitude.

6) Set TRIG COUPLING to DC.

7) Confirm that the trigger point is set at the middle of the observed waveform amplitude.
If the trigger point is not at the middle of the waveform amplitude, adjust the CH1 TRIG & X-AXIS DC OFFSET (RV107) control on the A1 board shown in Fig. 3.13.

8) Set VERT MODE to CH2.

9) Set the CH2 input coupling to AC, and apply the above signal to the CH2 input terminal.

10) Adjust TRIG LEVEL to set the trigger point at the middle of the observed waveform amplitude.

11) Set TRIG COUPLING to DC.

12) Confirm that the trigger point is set at the middle of the observed waveform amplitude.
If the trigger point is not at the middle of the waveform amplitude, adjust the CH2 TRIG DC OFFSET control (RV207) on the A1 board in Fig. 3.13.

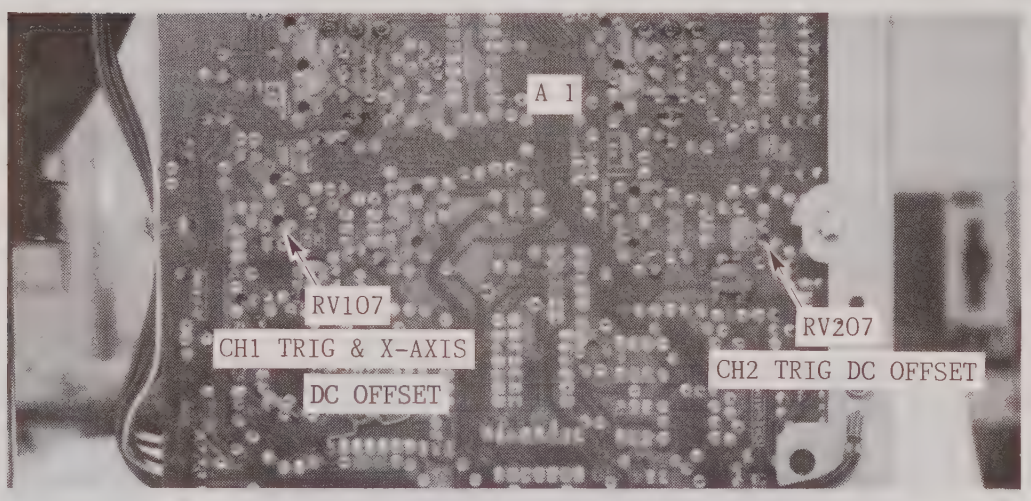


Fig. 3.13 INT TRIG DC OFFSET (RV107/RV207) Adjustment Positions

(6) Time axis adjustment

(a) Calibration of A sweep time

Calibrate the actual sweep speed to the value on panel.

1) Initialize the oscilloscope according to Table 3.6.

2) Apply a signal from a time marker set at 1 ms to the CH1 input terminal (50 Ω termination), and adjust the input sensitivity of the oscilloscope till the amplitude of the waveform observed on the CRT screen becomes approximately 2 DIV.

3) Confirm that the display cycle of the waveform observed on the CRT screen is 1 ms ±3%.
If the display cycle is not 1 ms ±3%, adjust the 1 ms CAL control (RV405) on the A2 board in Fig. 3.14.

4) Set the cycle of the time marker signal to 1 µs.

5) Set TIME/DIV to 1 µs/DIV.

6) Confirm that the display cycle of the waveform observed on the CRT screen is 1 µs ±3%.
If the display cycle is not 1 µs ±3%, adjust the 1 µs(A) CAL control (RV404) on the A2 board in Fig. 3.14.

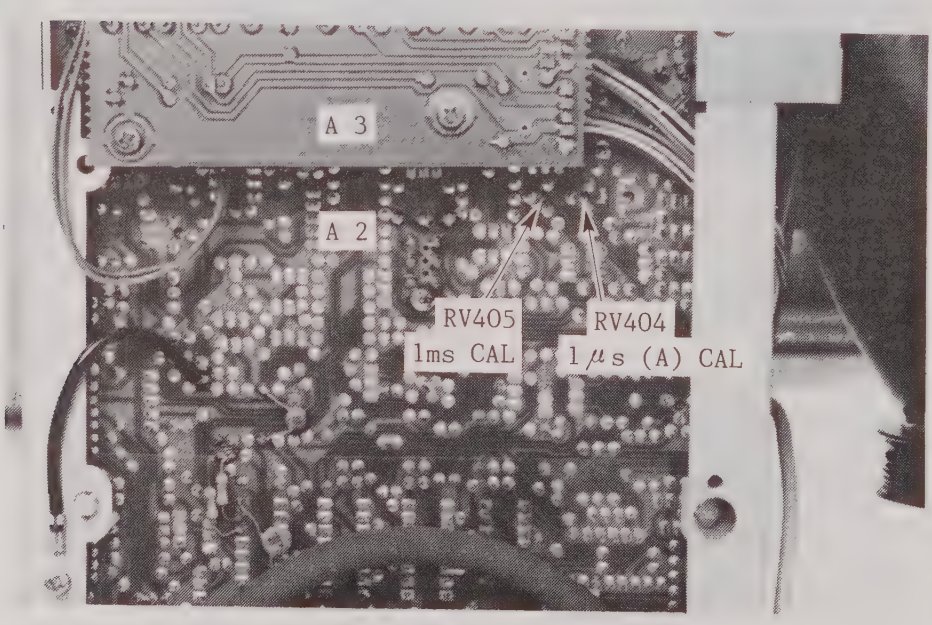


Fig. 3.14 1 ms CAL (RV405) and 1 µs(A) CAL (RV404) Adjustment Positions

(b) Calibration of B sweep time (COS5021TM/5041TM only)

Calibrate the actual delay sweep speed to the value on panel.

1) Initialize the oscilloscope according to Table 3.6.

2) Apply a signal from a time marker set at 1 μs to the CH1 input terminal (50Ω termination), and adjust the input sensitivity of the oscilloscope till the amplitude of the waveform observed on the CRT screen becomes approximately 2 DIV.

3) Set HOR DISPLAY to B.

4) Confirm that the display cycle of the waveform observed on the CRT screen is 1 μs ±3%.
If the display cycle is not 1 μs ±3%, adjust the 1 μs(B) CAL control (RV703) on the A2 board shown in Fig. 3.15.

(c) Sweep starting position (COS5021TM/5041TM only)

Adjust the starting point of A sweep to that of B sweep.

1) Initialize the oscilloscope according to Table 3.6.

2) Set the A sweep starting point at the left edge of the scale on CRT screen by adjusting H POSITION.

3) Set HOR DISPLAY to B.

4) Confirm that the B sweep starting point is at the left edge of the scale on CRT screen.
If the B sweep starting point is not found at the left edge of the scale, adjust the B START POSITION control (RV702) on the A2 board shown in Fig. 3.15.

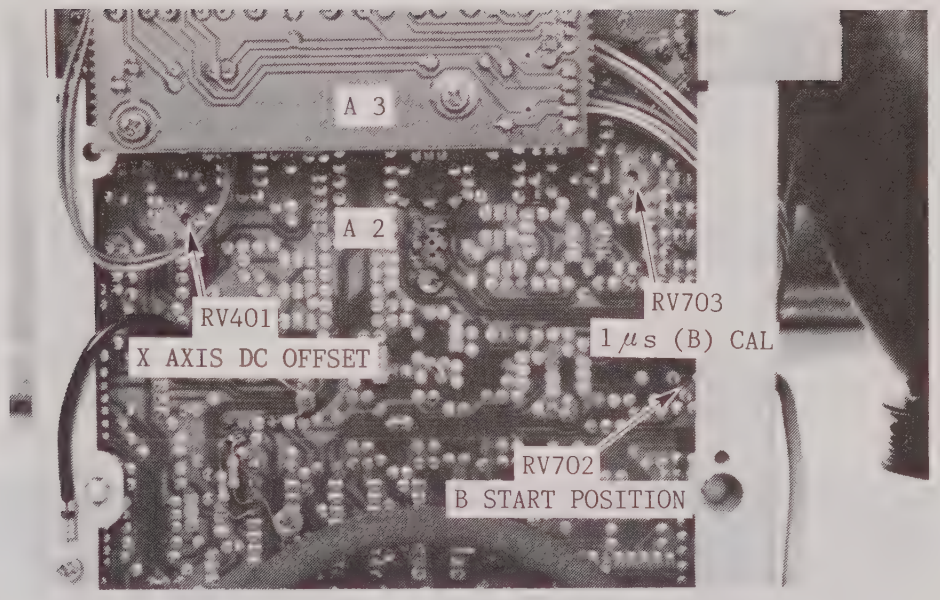


Fig. 3.15 1 μs(B) CAL (RV703), B START POSITION (RV702), and X AXIS DC OFFSET (RV401) Adjustment Positions

(7) Horizontal axis (X axis) adjustment

(a) Horizontal sensitivity adjustment

Adjust the actual sensitivity (X-Y operation mode) to the value on panel.

1) Initialize the oscilloscope according to Table 3.6.

2) Set VERT MODE to CH2.

3) Set INT TRIG to CH1.

4) Set TRIG COUPLING to DC.

5) Set TIME/DIV to EXT HOR or X-Y.

6) Apply an amplitude calibration signal from a vertical axis calibrator set at 100 mVp-p to the X input terminal (CH1) (open termination), and confirm that the sensitivity error for the 10 mV/DIV range is within ±3%. If the sensitivity error is not within ±3%, adjust the X-GAIN control (RV106) on the A1 board shown in Fig. 3.16.

(b) X-Y POSITION adjustment

Adjust the relationship between the sweep starting position in normal mode and the beam spot position in X-Y mode.

1) Initialize the oscilloscope according to Table 3.6.

2) Set the A sweep starting point at the left edge of the scale on CRT screen by adjusting H POSITION.

3) Set VERT MODE to CH2.

4) Set INT TRIG to CH1.

5) Set TRIG COUPLING to DC.

6) Set TIME/DIV to EXT HOR or X-Y.

7) Confirm that the beam spot is at the center of CRT screen ±1 DIV.
If the beam spot is not found at the center of the CRT screen ±1 DIV, adjust the X AXIS DC OFFSET control (RV401) on the A2 board shown in Fig. 3.15.

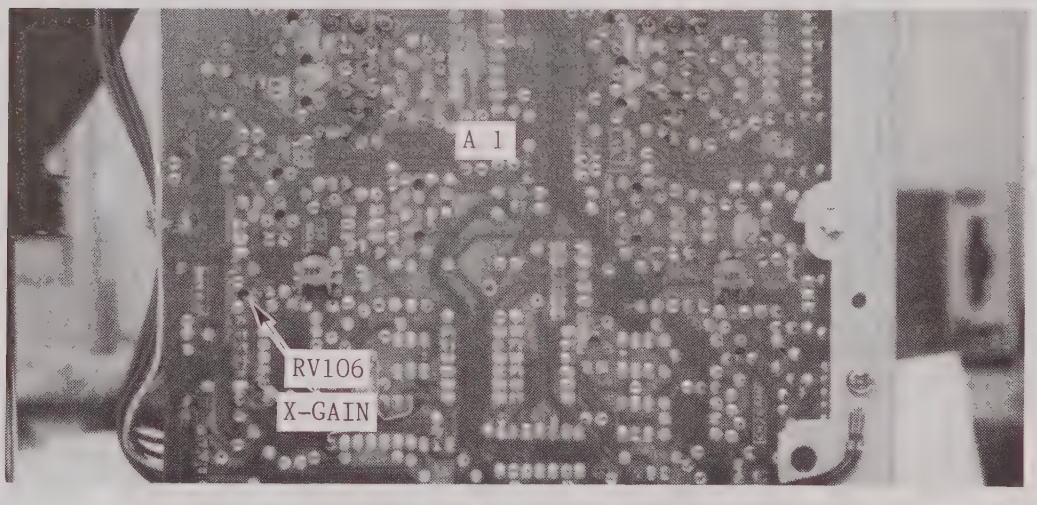


Fig. 3.16 X-GAIN (RV106) Adjustment Position

3.3-5 Adjustment parts allocation

Table 3.9 lists the adjustment parts required for the calibration of the oscilloscope, and Figs. 3.17 and 3.18 show their allocations on A1 board and A2 board respectively.

Table 3.9 Adjustment Parts List

No.	Item	Control Name	Reference Designator	Board
1	Power source voltage adjustment	+12V ADJ	RV606	A1
2	SUB INTEN adjustment	SUB INTEN	RV653	A2
3	SUB FOCUS adjustment	SUB FOCUS	RV651	A2
4	ASTIG adjustment	ASTIG	RV652	A2
5	Vertical axis DC BALANCE adjustment	CH1 STEP BAL	RV101	A1
6		CH2 STEP BAL	RV201	
7		CH1 MAG DC BAL	RV112	
8		CH2 MAG DC BAL	RV212	
9		CH1 VAR DC BAL	RV105	
10		CH2 VAR DC BAL	RV205	
11	Vertical axis sensitivity adjustment	CH1 GAIN	RV110	A1
12		CH2 GAIN	RV210	
13	Vertical axis sensitivity adjustment (×5 MAG)	CH1 ×5 GAIN	RV102	A1
14		CH2 ×5 GAIN	RV202	
15	Vertical axis DC BALANCE adjustment	ADD BAL	RV301	A1
16	Vertical axis square waveform characteristics (middle range)	COMP (M) ADJ	RV302	A1
17			C331	
18		CH1 COMP (M) ADJ	RV109	
19			C171	
20		CH2 COMP (M) ADJ	RV209	
21			C271	
22		CH1 COMP (H) ADJ	RV103	
23			C131	
24		CH2 COMP (H) ADJ	RV203	
25			C231	
26	Input attenuator (ATT) adjustment	CH1 1/10 ATT COMP	C103	A1
27		CH1 1/100 ATT COMP	C106	
28		CH2 1/10 ATT COMP	C203	
29		CH2 1/100 ATT COMP	C206	
30		CH1 1/10 ATT CAP	C102	
31		CH1 1/100 ATT CAP	C105	
32		CH2 1/10 ATT CAP	C202	
33		CH2 1/100 ATT CAP	C205	
34	CH1 signal output DC OFFSET adjustment	CH1 SIGNALOUT DC OFFSET	RV108	A1
35	Internal trigger DC OFFSET adjustment	CH1 TRIG & X-AXIS DC OFFSET	RV107	A1
36		CH2 TRIG DC OFFSET	RV207	
37	Time axis (A SWEEP) adjustment	1ms CAL	RV405	A2
38		1μs (A) CAL	RV404	
39	Time axis (B SWEEP) adjustment	1μs (B) CAL	RV703	A2
40	Sweep starting point adjustment	B START POSITION	RV702	A2
41	Horizontal axis sensitivity adjustment	X-GAIN	RV106	A1
42	X-Y POSITION adjustment	X AXIS DC OFFSET	RV401	A2

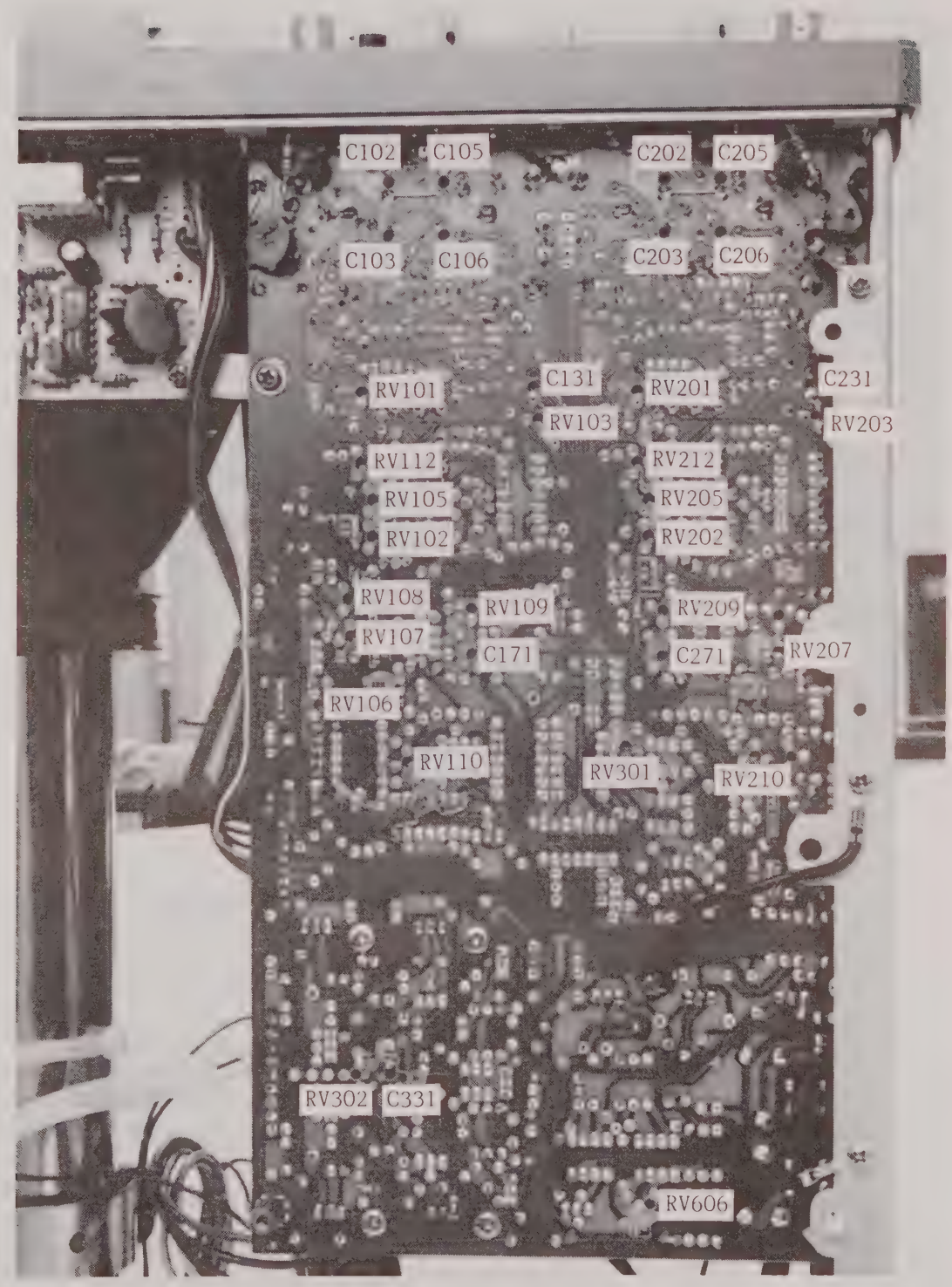


Fig. 3.17 Adjustment Parts Allocation on A1 Board

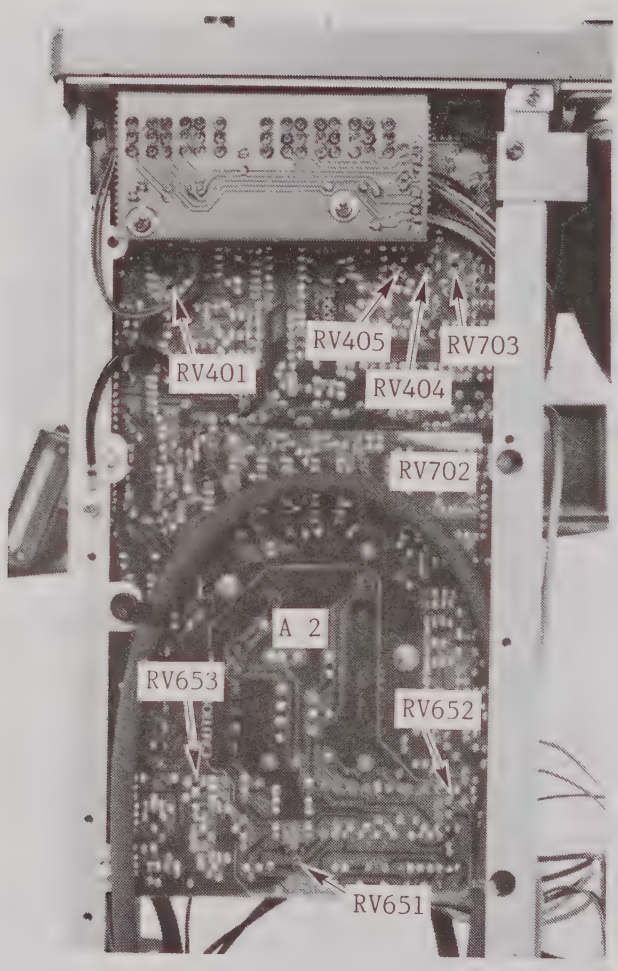


Fig. 3.18 Adjustment Parts Allocation on A2 Board

3.4 Troubleshooting

3.4-1 General description

If the oscilloscope does not function correctly and the malfunctioning is verified as a result of the inspection by operation, repair the instrument by using the block diagram, circuit schematics, parts appearances, parts locations, and parts lists (electronic/mechanical parts) given in this section.

After repairing the instrument, be sure to adjust the section that was malfunctioning or the entire instrument according to the calibration items.

3.4-2 Block diagrams

Figures 3.19 and 3.20 show the block diagrams of COS5020TM/21TM and COS5040TM/41TM respectively.

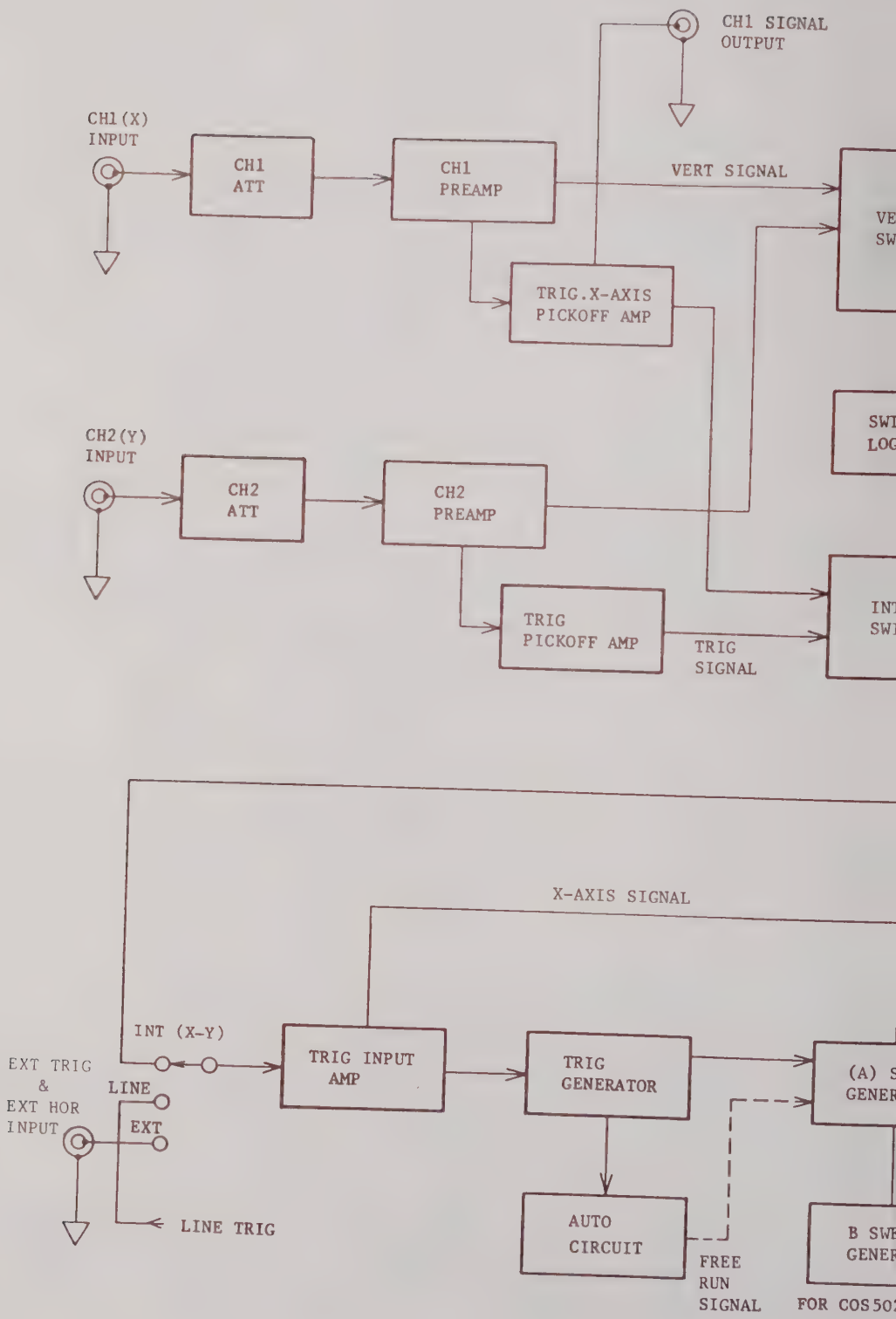
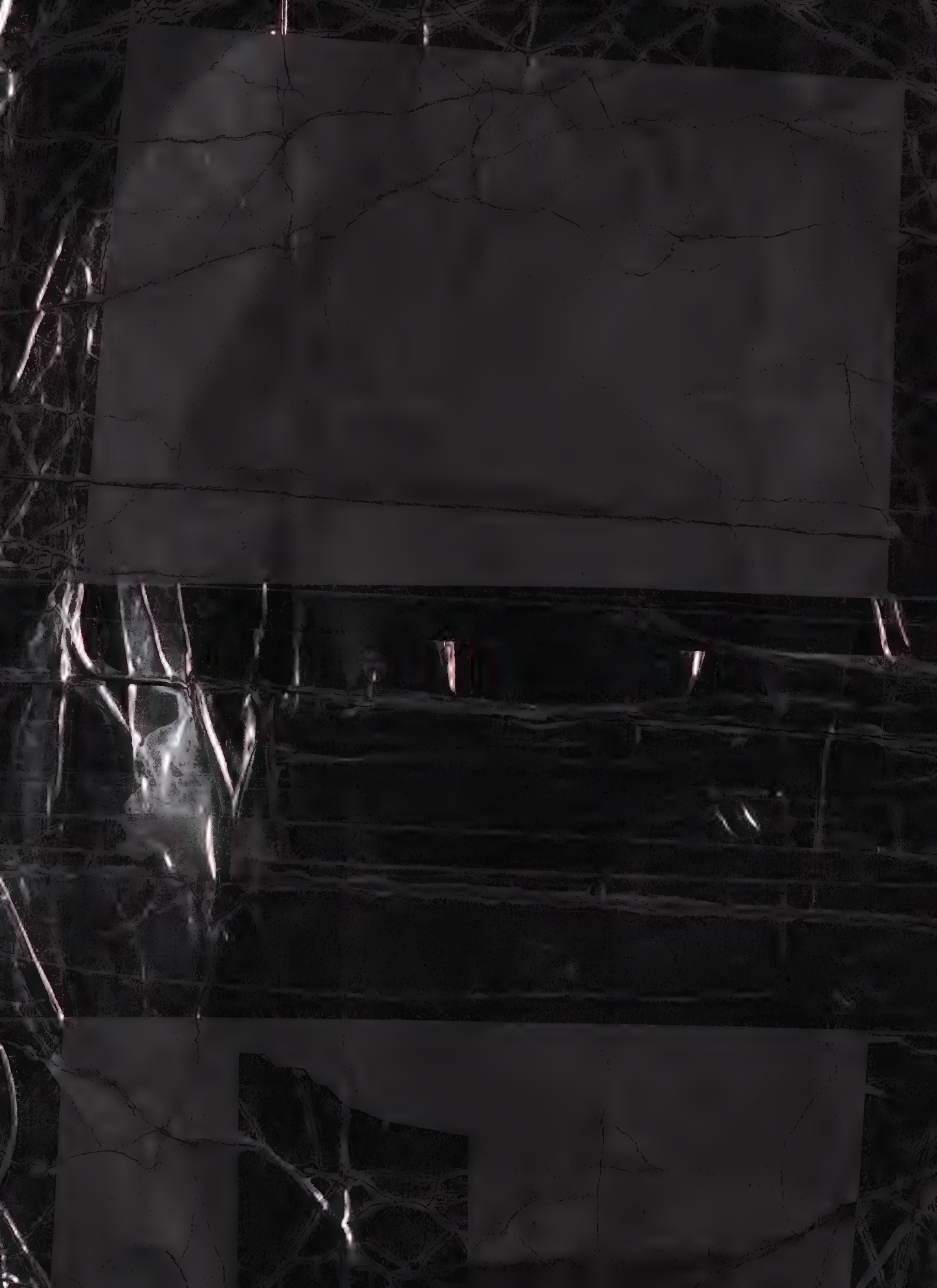
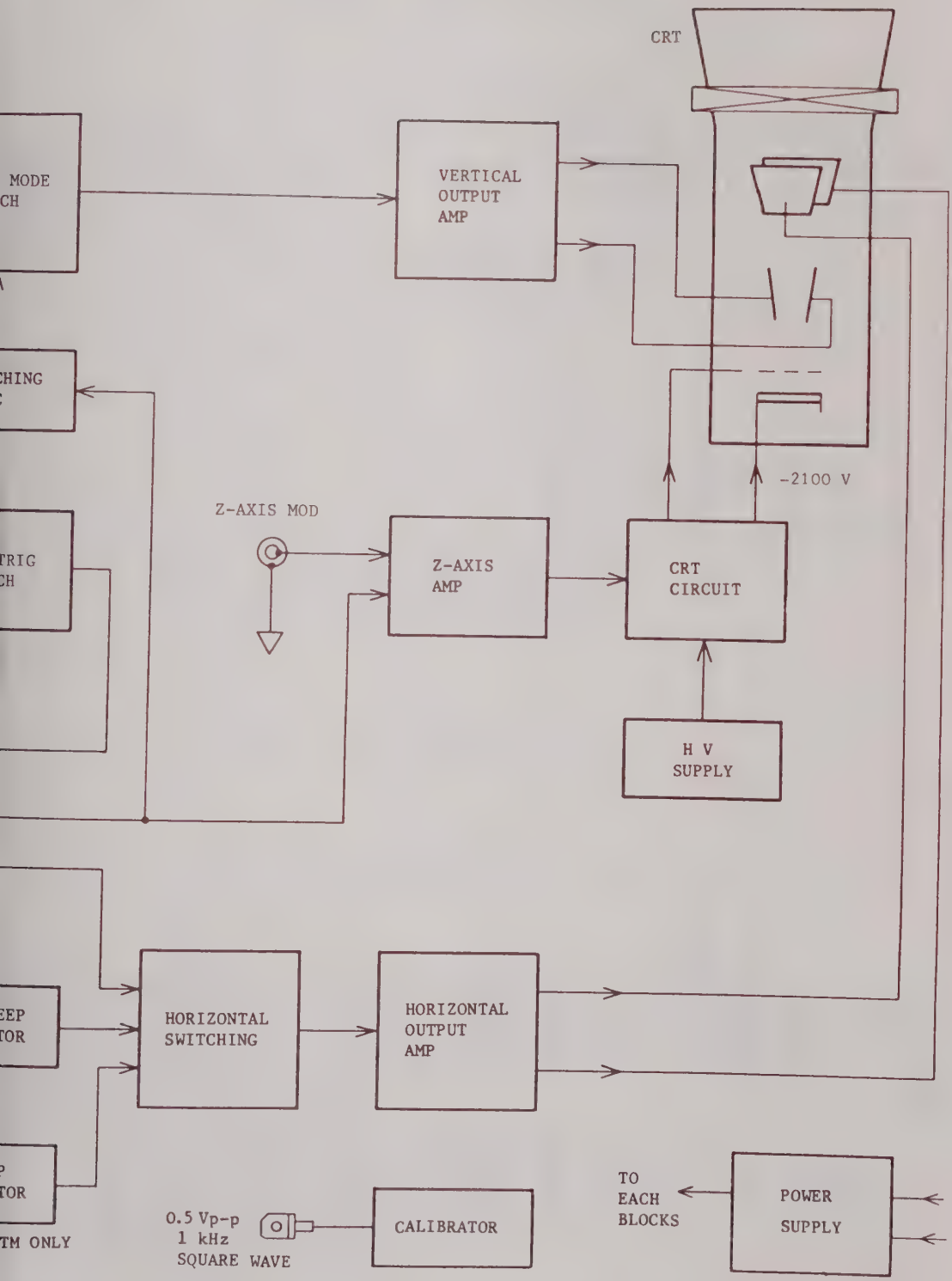


Fig. 3.19 Model COS5020TN





COS5021TM Block Diagram

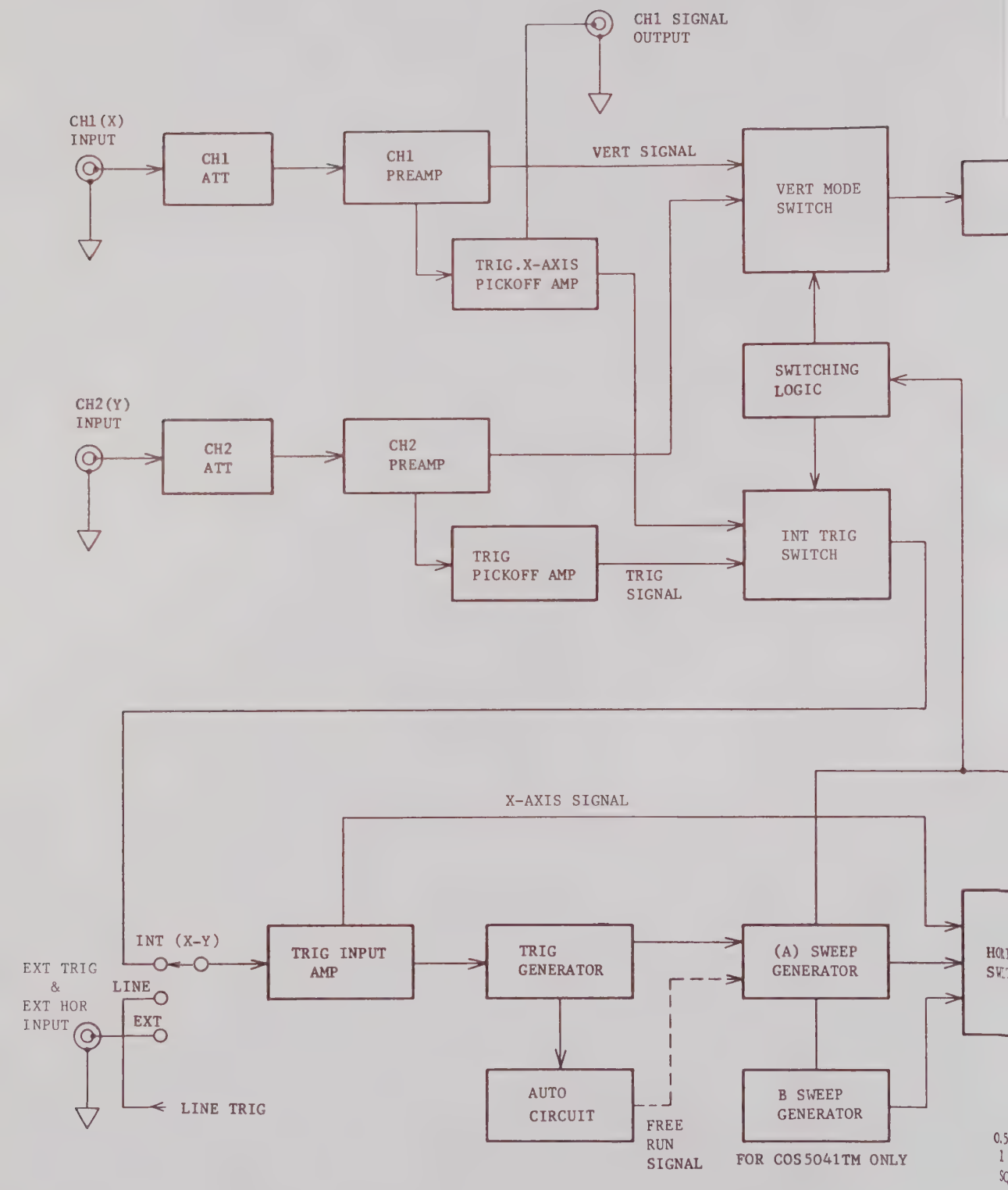
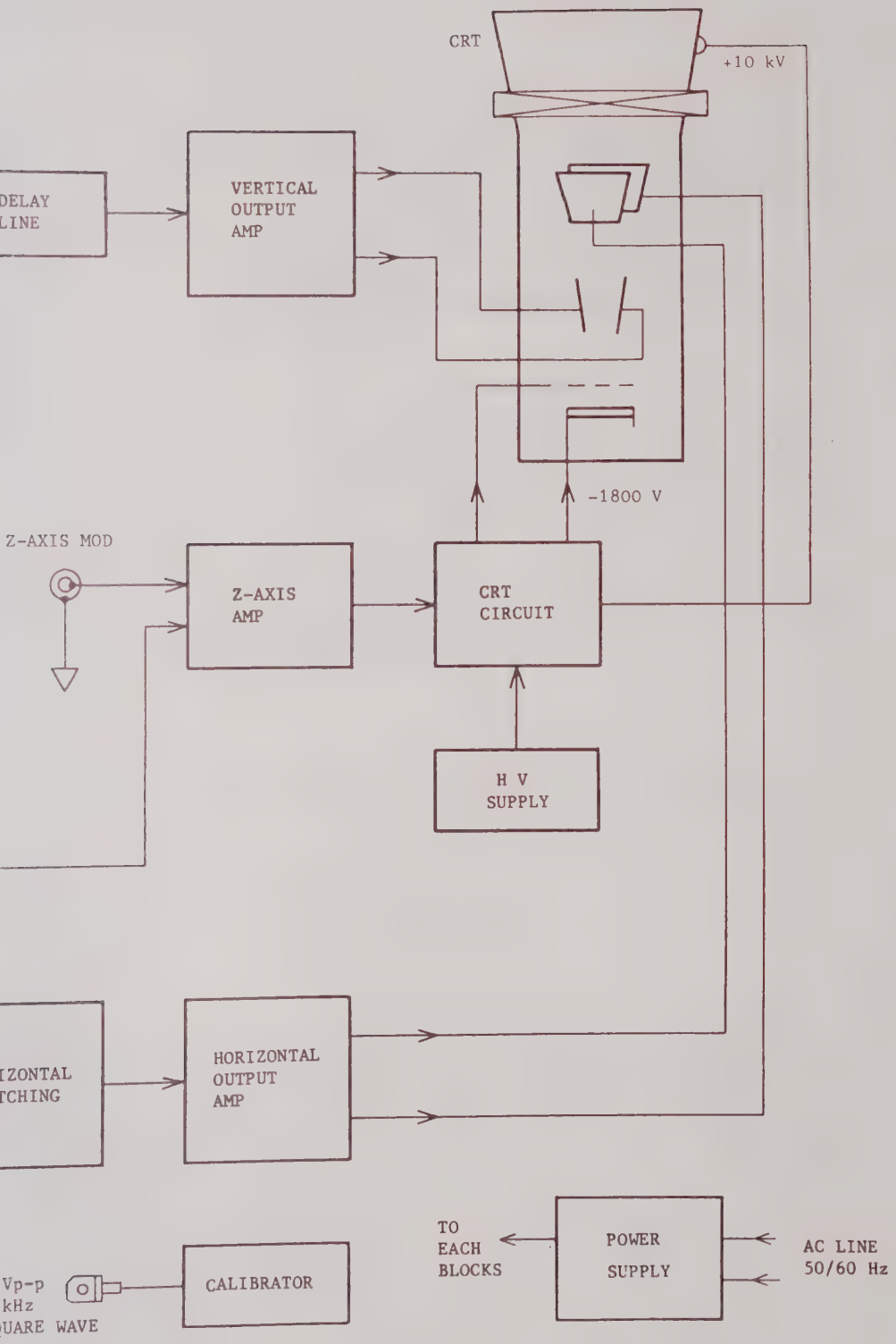


Fig. 3.20 Model COS5040TM/COS5041TM Block


CRT
+10 kV
DELAY
LINE
VERTICAL
OUTPUT
AMP
-1800 V
Z-AXIS MOD
Z-AXIS
AMP
CRT
CIRCUIT
H V
SUPPLY
IZONTAL
TCHING
HORIZONTAL
OUTPUT
AMP
TO
EACH
BLOCKS
POWER
SUPPLY
AC LINE
50/60 Hz
Vp-p
kHz
UARE WAVE
CALIBRATOR

Diagram

3.4-3 Circuit schematics

Figures 3.21 to 3.22 show the circuit schematics of the models described in this service manual.

* COS5020TM: Figs. 3.21 to 3.23
* COS5021TM: Figs. 3.24 to 3.26
* COS5040TM: Figs. 3.27 to 3.29
* COS5041TM: Figs. 3.30 to 3.32

Notes: In the circuit schematics, the units and some of the performances are omitted for the parts listed in Table 3.10.

Table 3.10 Omitted Units and Performances

Parts	Omitted Unit	Omitted Performance
Resistor	Ω (ohm)	If the precision of resistance value, allowable power, and resistor type are not specified, they are ±5%, 1/4 W, and carbon film resistor, respectively.
Capacitor	F (farad)	The type, precision, and maximum voltage vary with the capacitor. See the parts lists for details.

Table 3.11 lists the special symbols used on the circuit schematics.

Table 3.11 Special Symbols and Their Meanings

Symbol	Meaning
△	Metal film resistor
*	The part whose value may have to be changed in the course of production. The specified value is the typical value.
⊘	Pre-set resistor

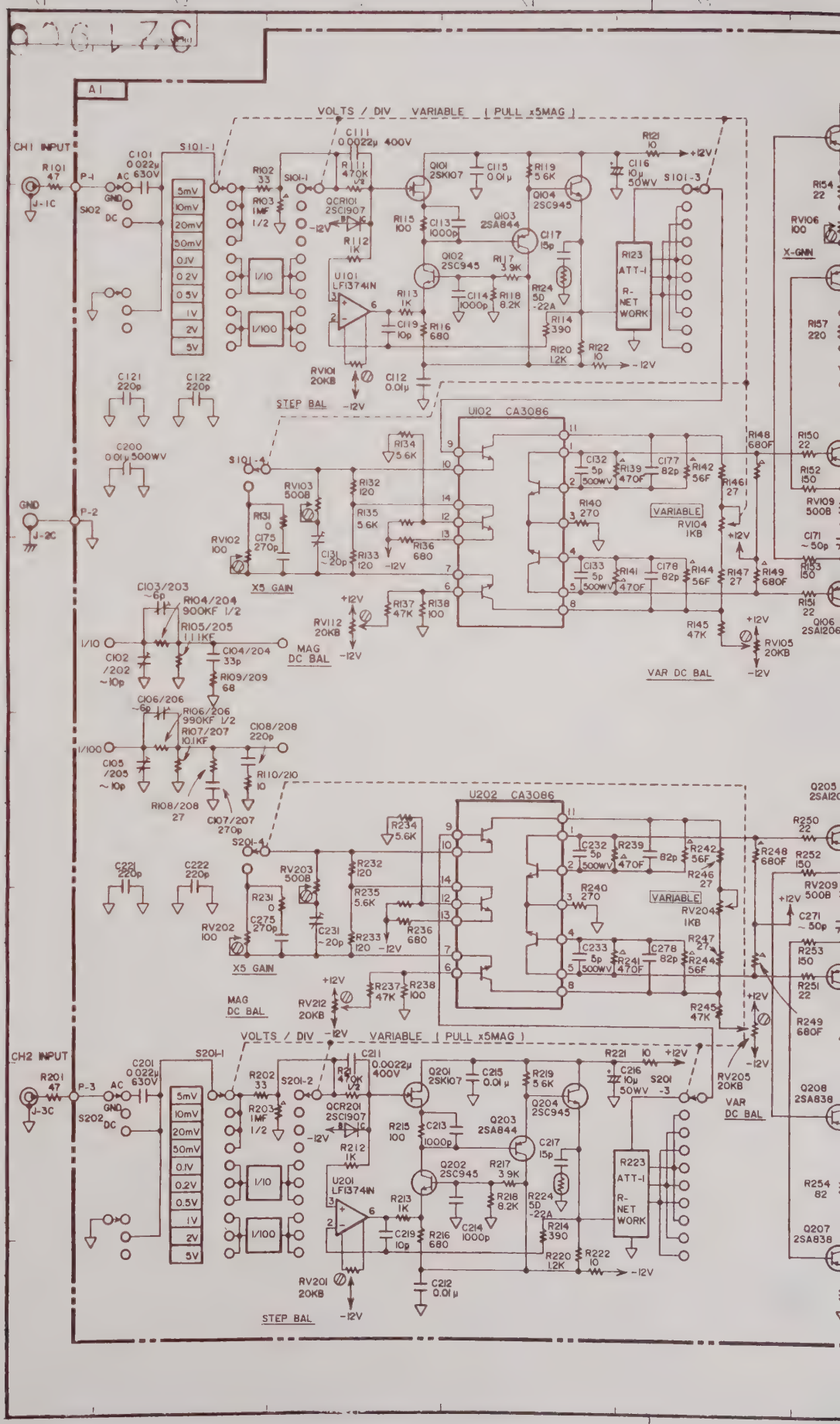
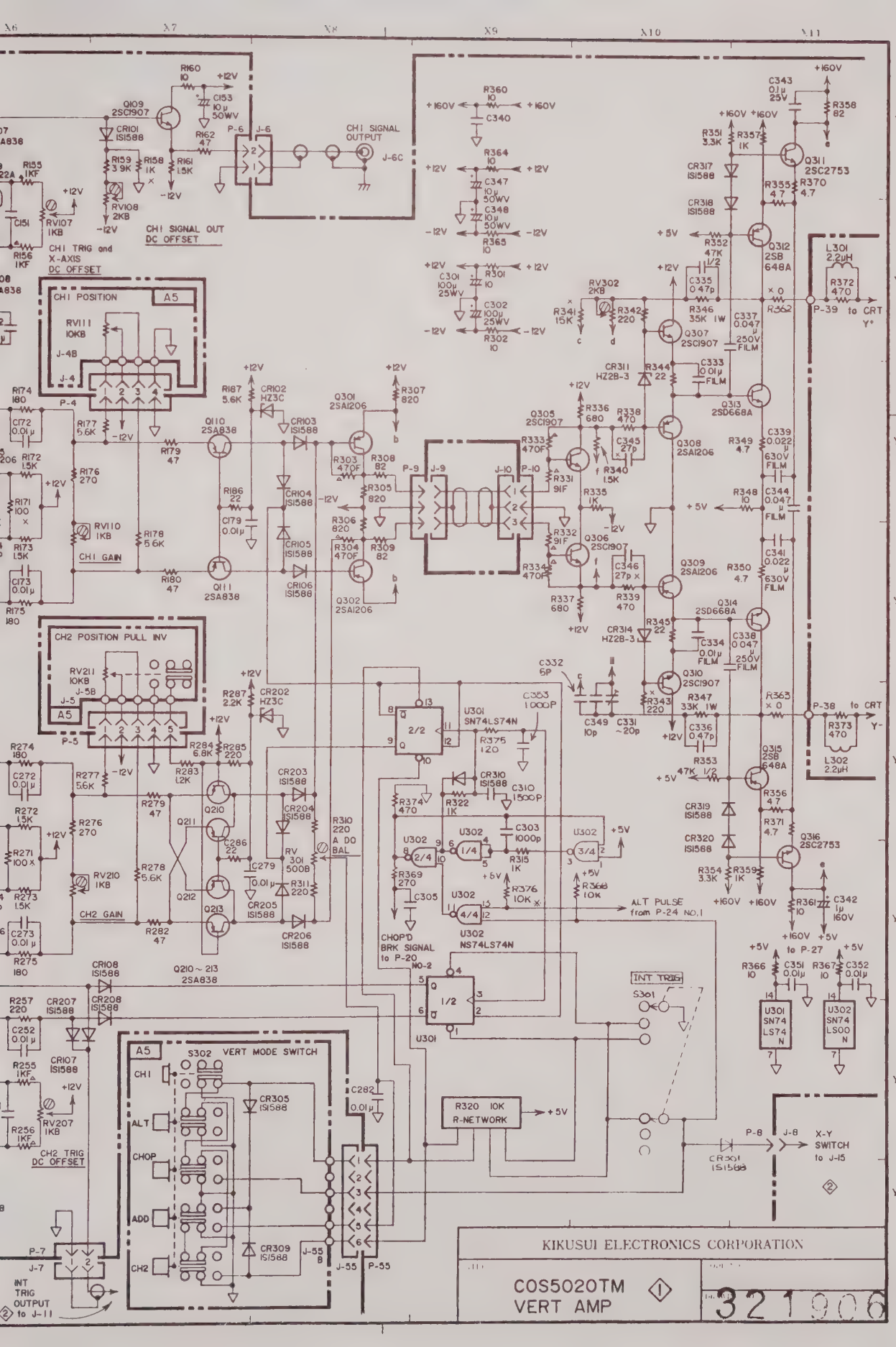

VOLTS / DIV VARIABLE (PULL x5MAG)
CH1 INPUT
CH2 INPUT
U101 LF1374N
U102 CA3086
U201 LF1374N
U202 CA3086
STEP BAL
X5 GAIN
MAG DC BAL
VAR DC BAL
VARIABLE
X-GAIN
ATT-1
R-NET WORK
5mV
10mV
20mV
50mV
0.1V
0.2V
0.5V
1V
2V
5V
1/10
1/100
+12V
-12V
GND

Fig. 3.21


CH1 SIGNAL OUTPUT
CH1 SIGNAL OUT DC OFFSET
CH1 TRIG and X-AXIS DC OFFSET
CH1 POSITION
CH1 GAIN
CH2 POSITION PULL INV
CH2 GAIN
CH2 TRIG DC OFFSET
S302 VERT MODE SWITCH
CHOP'D BRK SIGNAL to P-20
ALT PULSE from P-24 NO.1
INT TRIG
R320 10K R-NETWORK
X-Y SWITCH to J-15
INT TRIG OUTPUT to J-11
KIKUSUI ELECTRONICS CORPORATION
COS5020TM
VERT AMP
321906

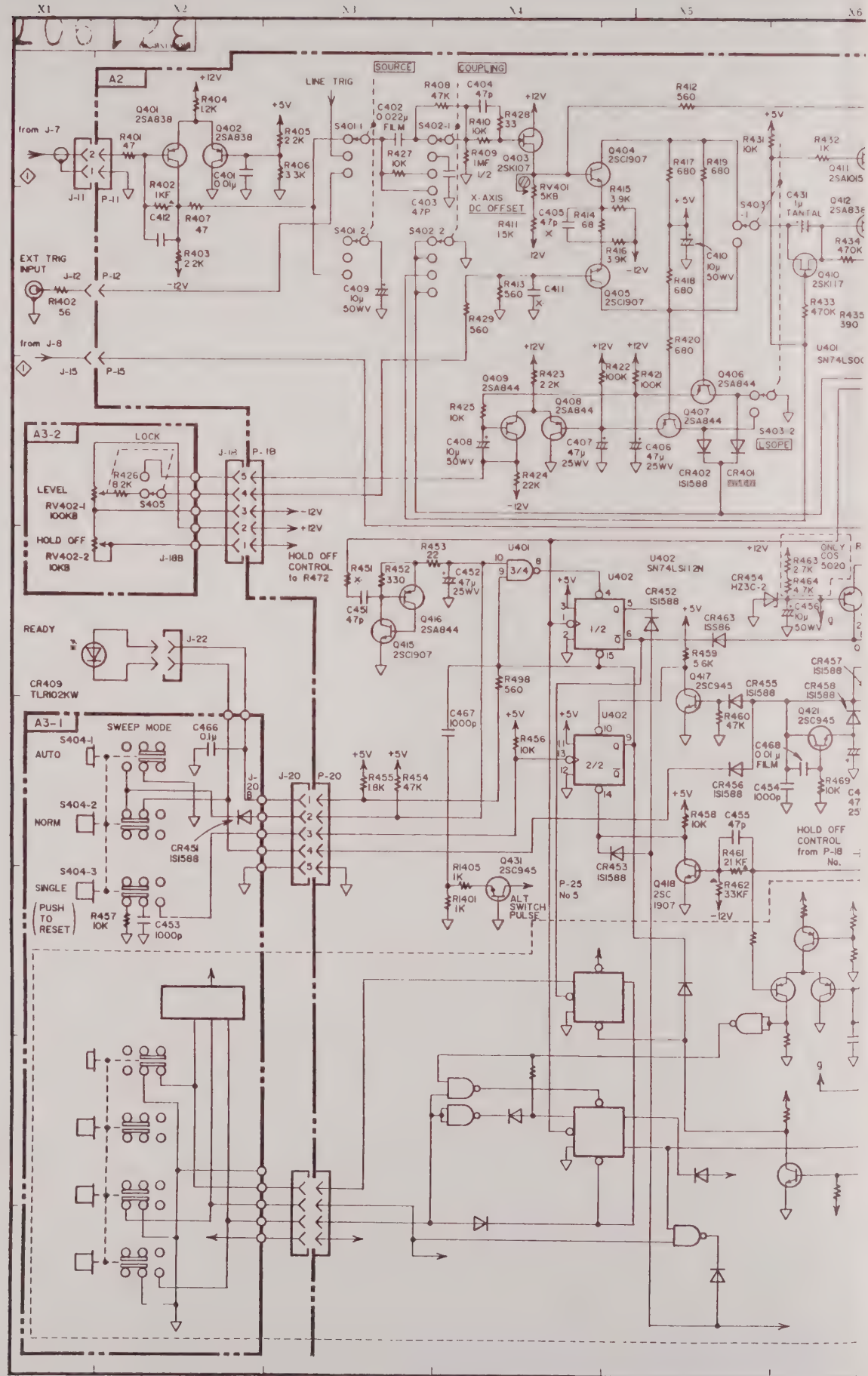
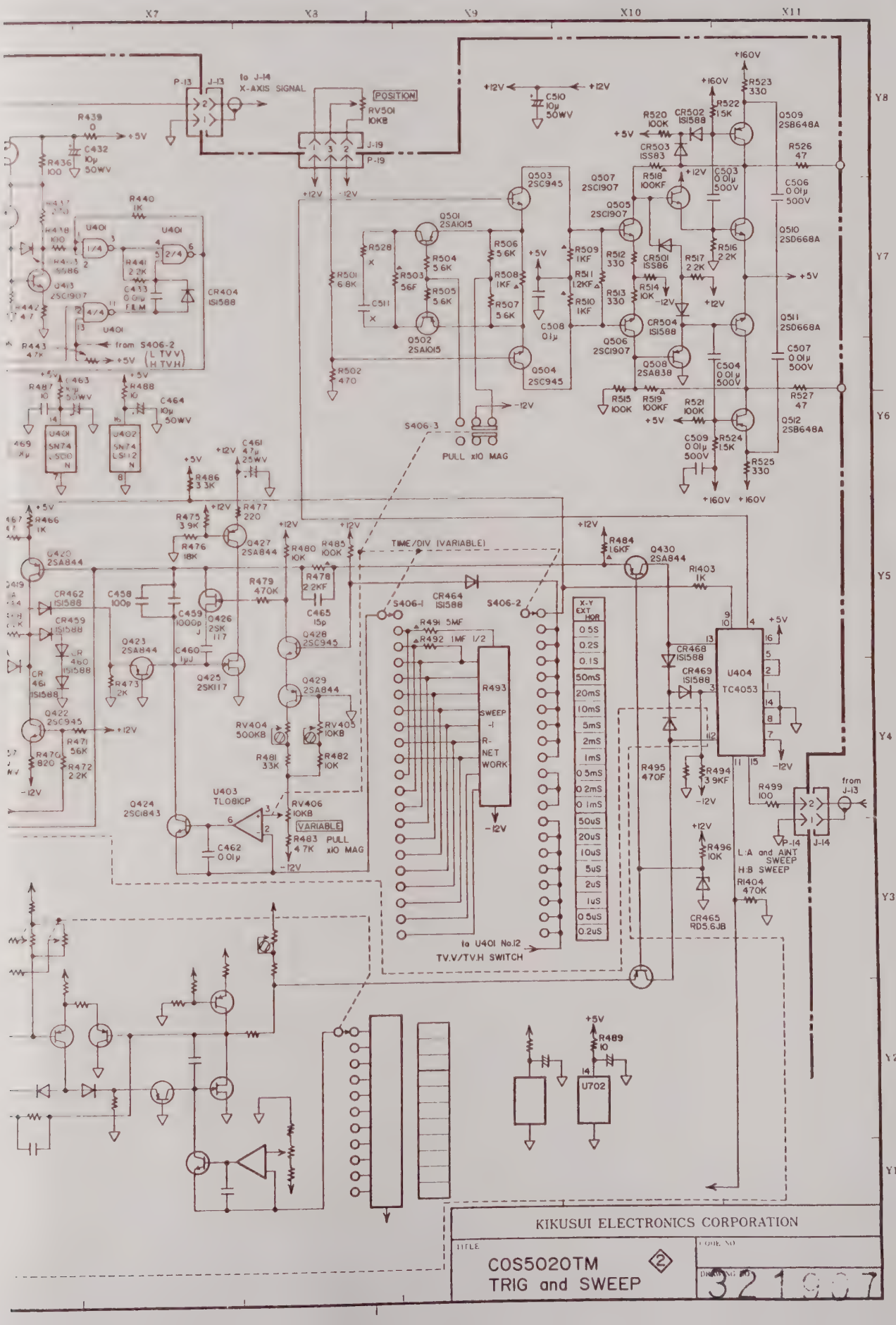
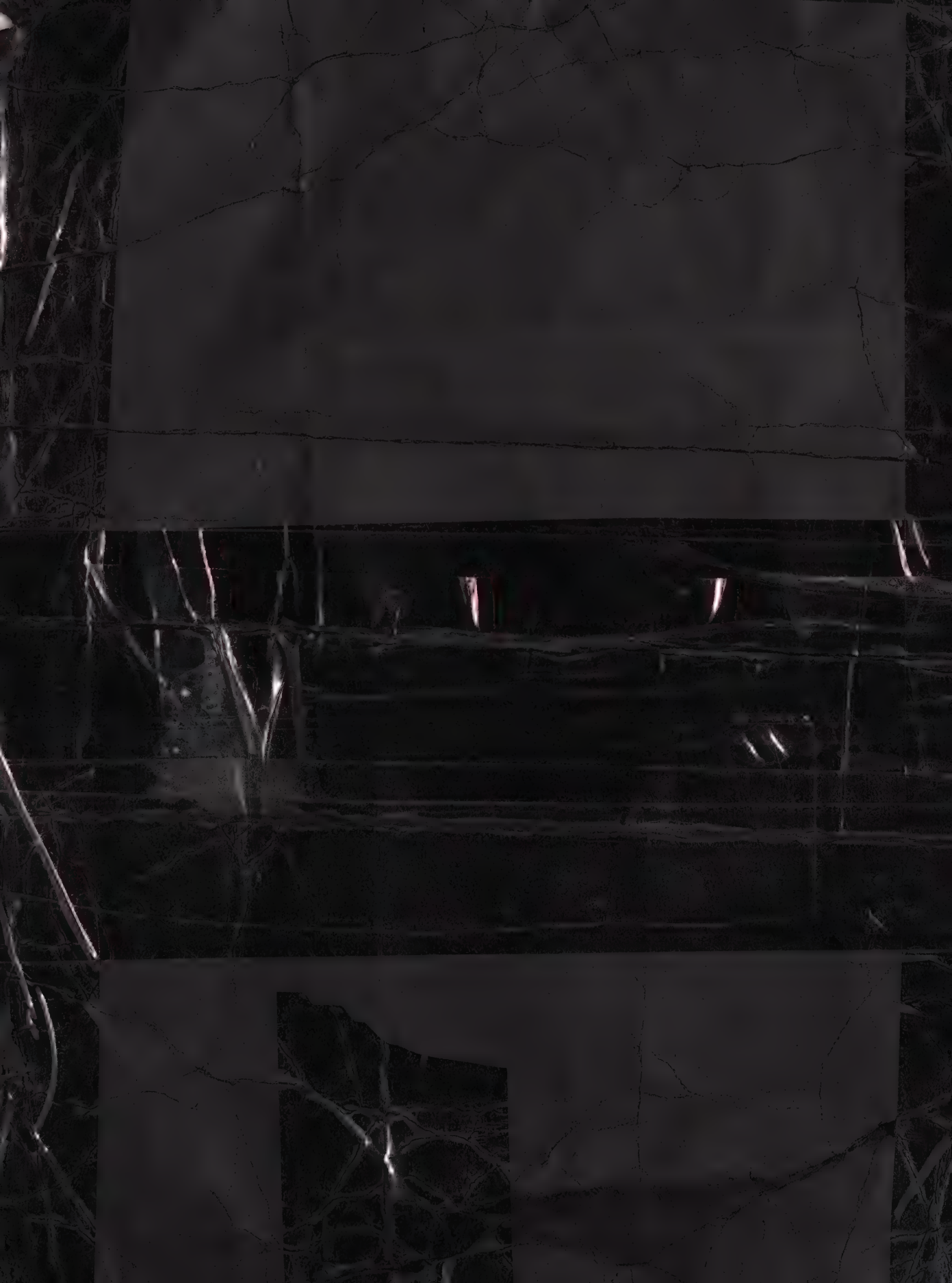

A2
A3-2
A3-1
SOURCE
COUPLING
LINE TRIG
X-AXIS DC OFFSET
EXT TRIG INPUT
from J-7
from J-8
LOCK
LEVEL
HOLD OFF
HOLD OFF CONTROL to R472
READY
CR409 TLR102KW
SWEEP MODE
AUTO
NORM
SINGLE
(PUSH TO RESET)
ALT SWITCH PULSE
HOLD OFF CONTROL from P-18 No.
P-25 No 5
LSOPE
ONLY COS 5020
U401 SN74LS00
U402 SN74LS112N

Fig. 3.22


X7
X8
X9
X10
X11
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1
P-13
J-13
to J-14
X-AXIS SIGNAL
POSITION
RV501
10KB
J-19
P-19
+12V
-12V
+5V
+160V
R439
0
C432
10μ
50WV
R436
100
R440
1K
U401
1/4
2/4
R441
2.2K
C433
0.01μ
FILM
CR404
1S1588
Q413
2SC1907
R443
4.7K
from S406-2
(L TV.V)
(H TV.H)
C463
10μ
50WV
C464
10μ
50WV
R487
10
R488
10
U401
SN74
LS00
N
U402
SN74
LS12
N
C461
47μ
25WV
R486
3.3K
R466
1K
Q420
2SA844
R475
3.9K
R476
18K
Q427
2SA844
R477
220
R480
10K
R485
100K
R478
2.2KF
C465
15p
R479
470K
Q428
2SC945
CR462
1S1588
CR459
1S1588
CR
461
1S1588
C458
100p
C459
1000p
J
Q426
2SK
117
C460
1μ
Q425
2SK117
Q423
2SA844
R473
2K
Q422
2SC945
R471
56K
R470
820
R472
2.2K
Q429
2SA844
RV404
500KB
RV405
10KB
R481
33K
R482
10K
U403
TL081CP
RV406
10KB
VARIABLE
R483
4.7K
PULL
x10 MAG
Q424
2SC1843
C462
0.01μ
TIME/DIV (VARIABLE)
S406-1
CR464
1S1588
S406-2
R491 5MF
R492 1MF 1/2
R493
SWEEP
-I
R-
NET
WORK
X-Y
EXT
HOR
0.5S
0.2S
0.1S
50mS
20mS
10mS
5mS
2mS
1mS
0.5mS
0.2mS
0.1mS
50uS
20uS
10uS
5uS
2uS
1uS
0.5uS
0.2uS
to U401 No.12
TV.V/TV.H SWITCH
R484
1.6KF
Q430
2SA844
RI403
1K
CR468
1S1588
CR469
1S1588
U404
TC4053
R495
470F
R494
3.9KF
R499
100
from
J-13
P-14
J-14
L:A and AINT
SWEEP
H:B SWEEP
R496
10K
RI404
470K
CR465
RD5.6JB
R489
10
U702
Q503
2SC945
Q501
2SA1015
Q502
2SA1015
Q504
2SC945
R528
R501
6.8K
C511
R502
470
R503
56F
R504
5.6K
R505
5.6K
R506
5.6K
R507
5.6K
R508
1KF
R509
1KF
R511
1.2KF
R510
1KF
C508
0.1μ
Q507
2SC1907
Q505
2SC1907
Q506
2SC1907
Q508
2SA838
R512
330
R513
330
CR501
1SS86
CR504
1S1588
R514
10K
R515
100K
R519
100KF
R517
2.2K
R518
100KF
R516
2.2K
R521
100K
C503
0.01μ
500V
C504
0.01μ
500V
C509
0.01μ
500V
R524
1.5K
R525
330
R520
100K
CR502
1S1588
CR503
1SS83
R522
1.5K
R523
330
Q509
2SB648A
Q510
2SD668A
Q511
2SD668A
Q512
2SB648A
R526
47
C506
0.01μ
500V
C507
0.01μ
500V
R527
47
S406-3
PULL x10 MAG
KIKUSUI ELECTRONICS CORPORATION
TITLE
COS5020TM
TRIG and SWEEP
②
CODE NO
DRAWING NO
321007



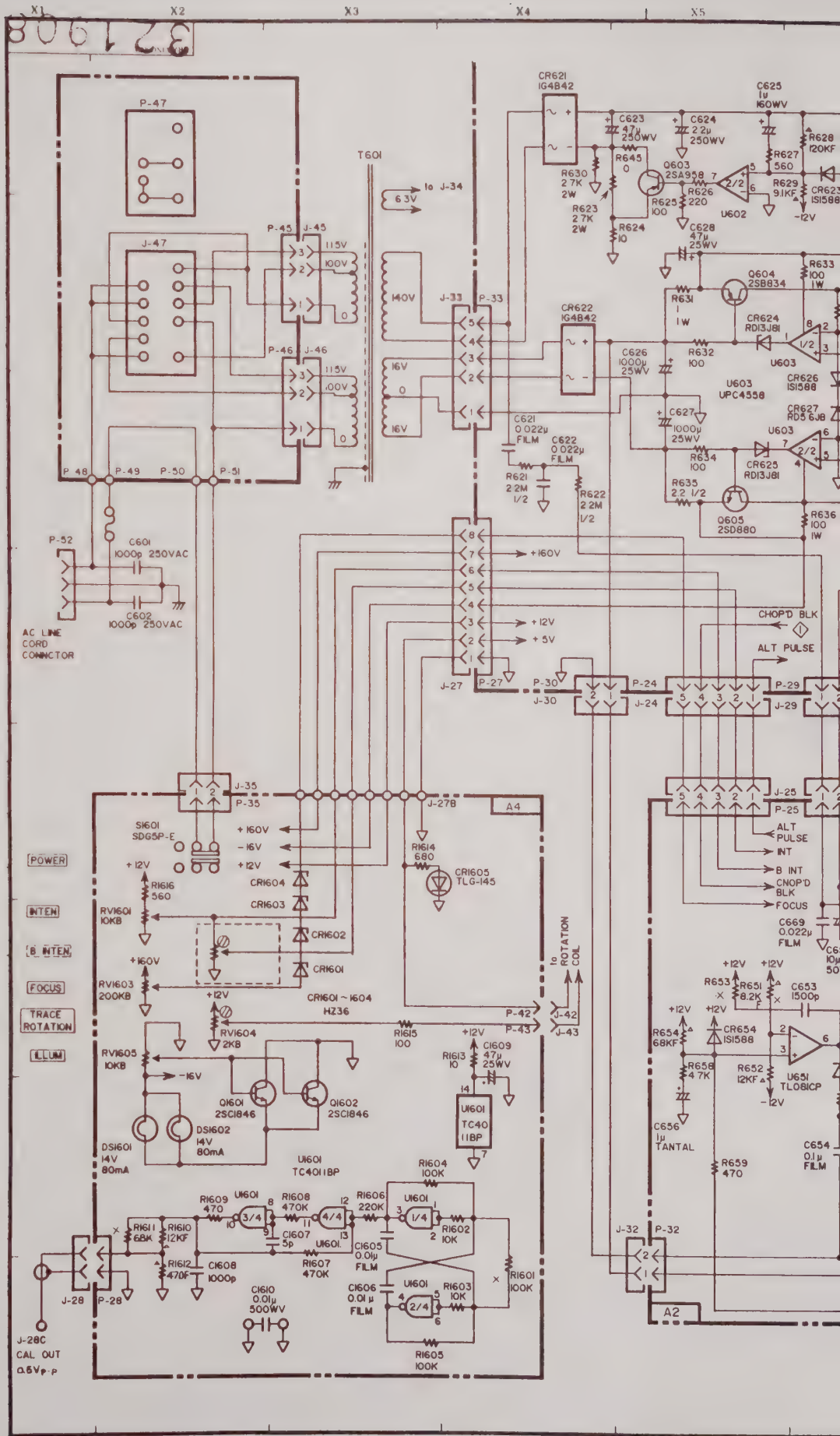
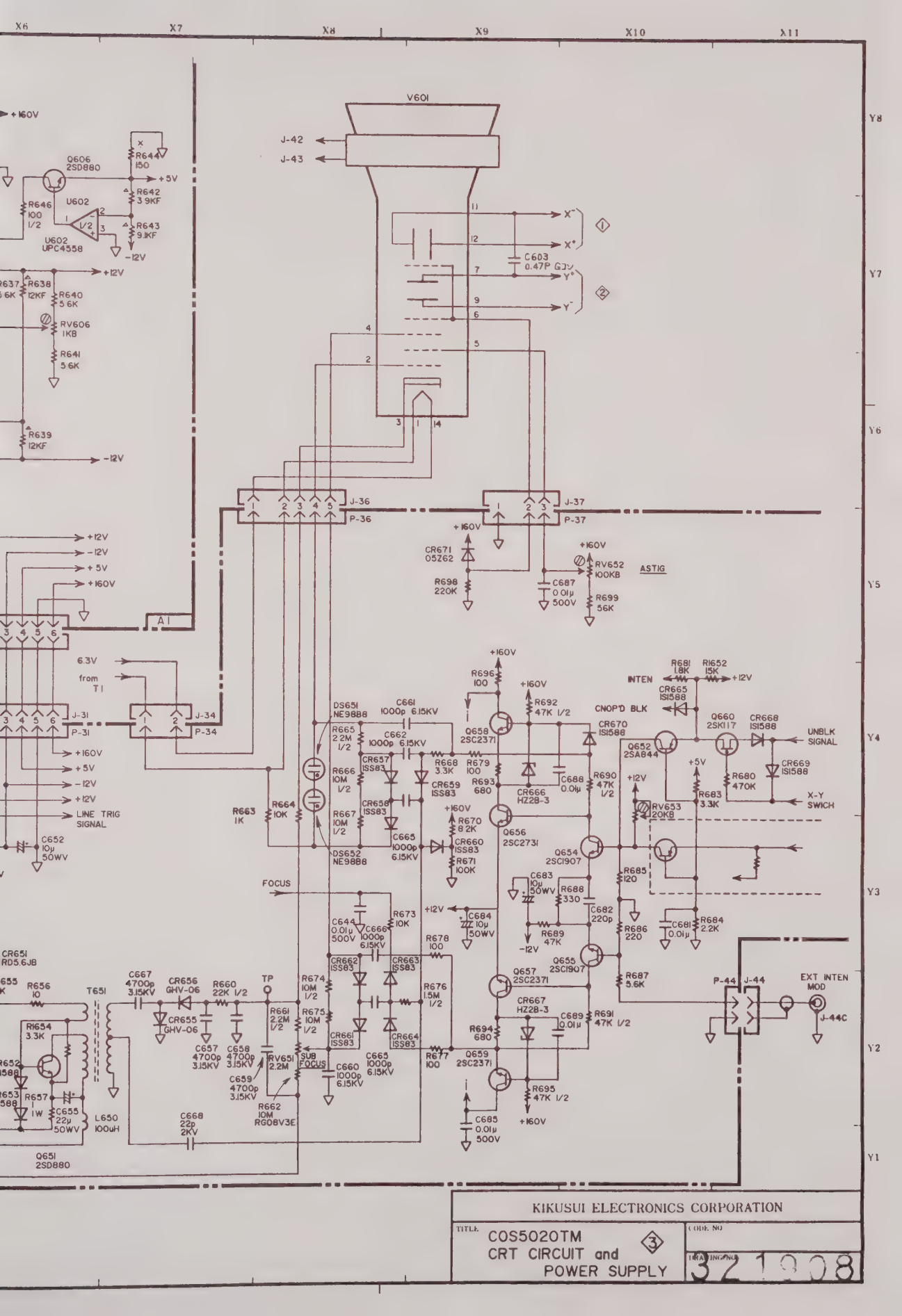

X1
X2
X3
X4
X5
P-47
J-47
P-45
J-45
P-46
J-46
T601
115V
100V
0
140V
16V
J-33
P-33
P 48
P-49
P-50
P-51
P-52
C601
1000p 250VAC
C602
1000p 250VAC
AC LINE
CORD
CONNCTOR
CR621
1G4B42
CR622
1G4B42
C623
47µ
250WV
C624
2.2µ
250WV
C625
1µ
160WV
R628
120KF
R627
560
R645
0
Q603
2SA958
R630
2.7K
2W
R623
2.7K
2W
R625
100
R626
220
R629
9.1KF
CR623
1SI588
-12V
U602
R624
10
C628
47µ
25WV
Q604
2SB834
R633
100
1W
R631
1
1W
CR624
RD13J81
U603
R632
100
C626
1000µ
25WV
CR626
1SI588
U603
UPC4558
C627
1000µ
25WV
CR627
RD5.6J8
R634
100
CR625
RD13J81
R635
2.2 1/2
Q605
2SD880
R636
100
1W
C621
0.022µ
FILM
C622
0.022µ
FILM
R621
2.2M
1/2
R622
2.2M
1/2
+160V
+12V
+5V
CHOP'D BLK
ALT PULSE
J-27
P-27
P-30
J-30
P-24
J-24
P-29
J-29
J-25
P-25
J-35
P-35
J-278
A4
SI601
SDG5P-E
POWER
INTEN
B INTEN
FOCUS
TRACE
ROTATION
ILLUM
+160V
-16V
+12V
R1616
560
RV1601
10KB
RV1603
200KB
RV1604
2KB
RV1605
10KB
CR1604
CR1603
CR1602
CR1601
CR1601 ~ 1604
HZ36
R1614
680
CR1605
TLG-145
R1615
100
P-42
P-43
J-42
J-43
to ROTATION COIL
Q1601
2SC1846
Q1602
2SC1846
DS1601
14V
80mA
DS1602
14V
80mA
U1601
TC4011BP
R1613
10
C1609
47µ
25WV
R1604
100K
R1609
470
R1608
470K
R1606
220K
R1611
68K
R1610
12KF
R1612
470F
C1608
1000p
C1607
5p
U1601.
R1607
470K
C1605
0.01µ
FILM
C1606
0.01µ
FILM
R1603
10K
R1602
10K
R1601
100K
R1605
100K
C1610
0.01µ
500WV
J-28
P-28
J-28C
CAL OUT
0.5Vp-p
ALT PULSE
INT
B INT
CHOP'D BLK
FOCUS
C669
0.022µ
FILM
R653
8.2K
R651
C653
1500p
R654
68KF
CR654
1SI588
R658
4.7K
R652
12KF
U651
TL081CP
C656
1µ
TANTAL
C654
0.1µ
FILM
R659
470
J-32
P-32
A2

Fig. 3.23


X6
X7
X8
X9
X10
X11
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1
V601
J-42
J-43
C603 0.47P
J-36
P-36
J-37
P-37
A1
J-31
P-31
J-34
P-34
+160V
+12V
-12V
+5V
6.3V
from T1
LINE TRIG SIGNAL
Q606 2SD880
U602 UPC4558
R644 150
R642 3.9KF
R643 9.1KF
R646 100 1/2
R640 5.6K
R641 5.6K
RV606 1KB
R637 6K
R638 12KF
R639 12KF
C652 10µ 50WV
CR671 05Z62
R698 220K
C687 0.01µ 500V
RV652 100KB
ASTIG
R699 56K
R696 100
R692 47K 1/2
Q659 2SC2371
R693 680
R694 680
R695 47K 1/2
C685 0.01µ 500V
DS651 NE9888
DS652 NE9888
C661 1000p 6.15KV
C662 1000p 6.15KV
R665 2.2M 1/2
R666 10M 1/2
R667 10M 1/2
R668 3.3K
R679 100
CR657 ISS83
CR658 ISS83
CR659 ISS83
CR660 ISS83
C665 1000p 6.15KV
R670 8.2K
R671 100K
R663 1K
R664 10K
FOCUS
C644 0.01µ 500V
C666 1000p 6.15KV
R673 10K
C684 10µ 50WV
R678 100
R676 1.5M 1/2
R674 10M 1/2
R675 10M 1/2
R661 2.2M 1/2
CR662 ISS83
CR663 ISS83
CR664 ISS83
CR661 ISS83
RV651 2.2M SUB FOCUS
R662 10M RG08V3E
C660 1000p 6.15KV
C659 4700p 3.15KV
R677 100
C668 22p 2KV
C667 4700p 3.15KV
CR656 GHV-06
CR655 GHV-06
R660 22K 1/2
C657 4700p 3.15KV
C658 4700p 3.15KV
TP
T651
L650 100uH
C655 22µ 50WV
R657 1 1W
R654 3.3K
R656 10
CR651 RD5.6JB
Q651 2SD880
Q656 2SC2731
Q657 2SC2371
CR667 HZ28-3
C689 0.01µ
R691 47K 1/2
Q655 2SC1907
R687 5.6K
C683 10µ 50WV
R688 330
R689 47K
C682 220p
R685 120
R686 220
C681 0.01µ
R684 2.2K
Q654 2SC1907
CR666 HZ28-3
C688 0.01µ
R690 47K 1/2
CNOP'D BLK
CR670 ISI588
INTEN
R681 1.8K
R1652 15K
CR665 ISI588
Q652 2SA844
Q660 2SK117
CR668 ISI588
UNBLK SIGNAL
CR669 ISI588
R680 470K
R683 3.3K
X-Y SWICH
RV653 20KB
P-44
J-44
EXT INTEN MOD
J-44C
KIKUSUI ELECTRONICS CORPORATION
TITLE
COS5020TM
CRT CIRCUIT and
POWER SUPPLY
③
CODE NO
DRAWING No.
321008

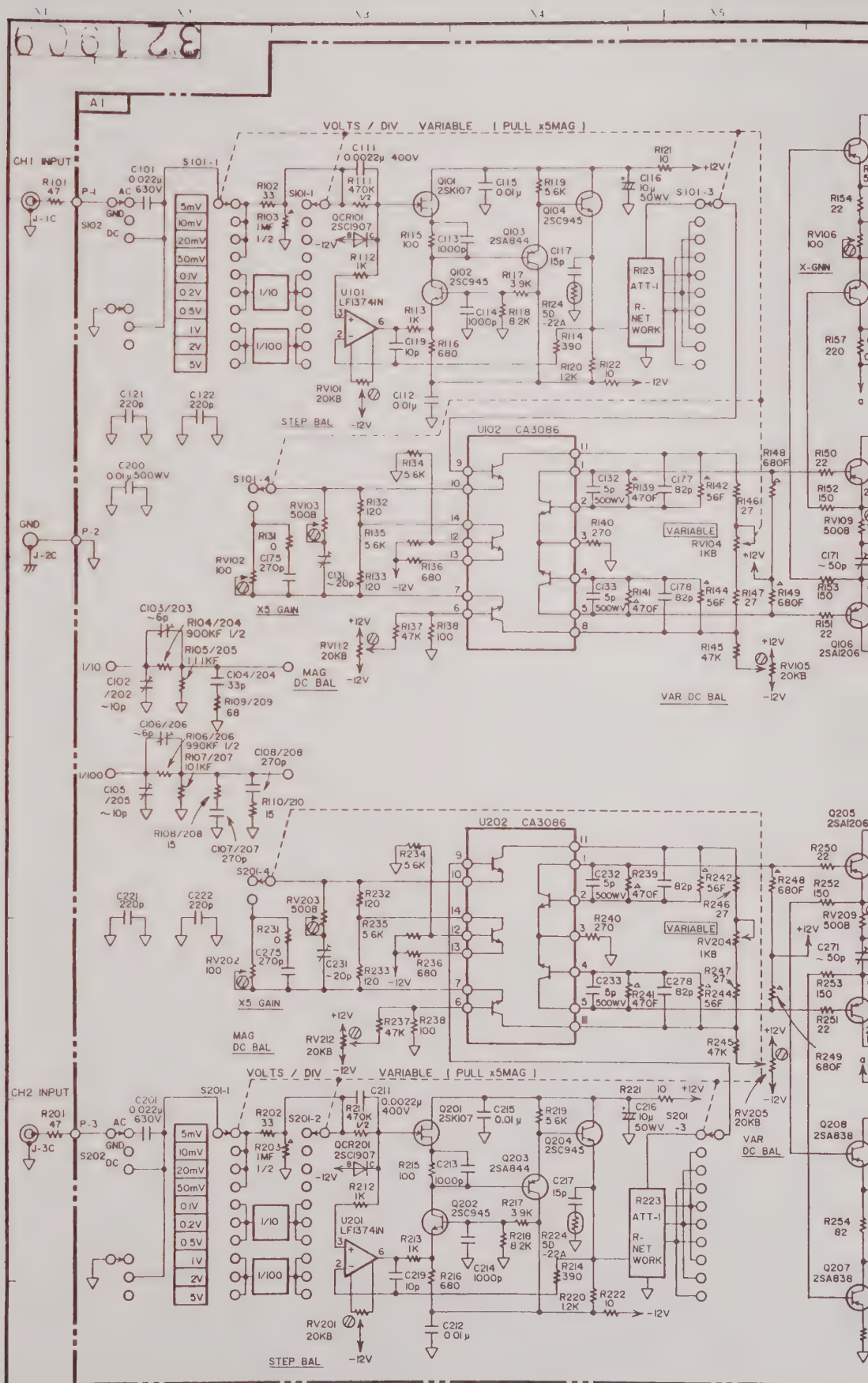
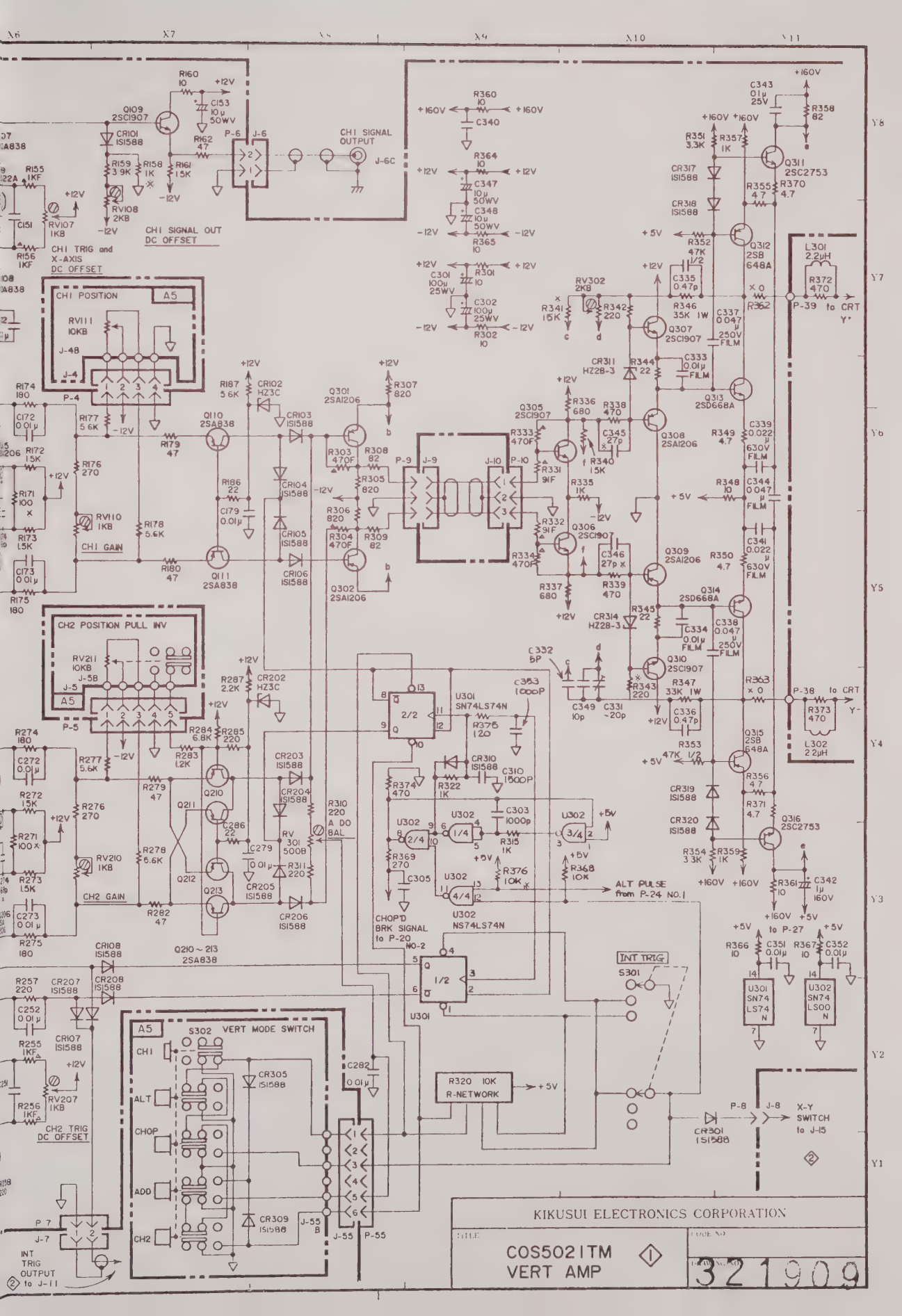

A1
VOLTS / DIV VARIABLE [PULL x5MAG]
CH1 INPUT
J-1C
P-1
GND
DC
S102
S101-1
5mV
10mV
20mV
50mV
0.1V
0.2V
0.5V
1V
2V
5V
1/10
1/100
C101 0.022µ AC 630V
R101 47
C111 0.0022µ 400V
R111 470K VR
R102 33
R103 1MF 1/2
QCR101 2SC1907
R112 1K
U101 LF13741N
RV101 20KB
STEP BAL
C112 0.01µ
Q101 2SK107
Q102 2SC945
Q103 2SA844
Q104 2SC945
C113 1000p
C114 1000p
C115 0.01µ
C117 15p
C119 10p
R113 1K
R114 390
R115 100
R116 680
R117 3.9K
R118 8.2K
R119 5.6K
R120 12K
R121 10
R122 10
R123 ATT-1 R-NET WORK
R124 50 -22A
C116 10µ 50WV
S101-3
+12V
-12V
C121 220p
C122 220p
C200 0.01µ 500WV
GND
P-2
J-2C
S101-4
U102 CA3086
RV102 100
RV103 5008
C131 ~20p
C175 270p
R131 0
R132 120
R133 120
R134 5.6K
R135 5.6K
R136 680
R137 47K
R138 100
X5 GAIN
RV112 20KB
MAG DC BAL
C132 5p 500WV
C133 5p 500WV
C139 470F
C141 470F
C177 82p
C178 82p
R139
R140 270
R141
R142 56F
R144 56F
R145 47K
R146 27
R147 27
R148 680F
R149 680F
VARIABLE
RV104 1KB
RV105 20KB
VAR DC BAL
C103/203 ~6p
R104/204 900KF 1/2
R105/205 1.1KF
C102 /202 ~10p
C104/204 33p
R109/209 68
C106/206 ~6p
R106/206 990KF 1/2
R107/207 101KF
C108/208 270p
C105 /205 ~10p
R108/208 15
R110/210 15
C107/207 270p
1/10
1/100
U202 CA3086
RV202 100
RV203 5008
C231 ~20p
C275 270p
R231 0
R232 120
R233 120
R234 5.6K
R235 5.6K
R236 680
R237 47K
R238 100
X5 GAIN
RV212 20KB
MAG DC BAL
C232 5p 500WV
C233 5p 500WV
R239 470F
R241 470F
R242 56F
R244 56F
R245 47K
R246 27
R247 27
R248 680F
R249 680F
VARIABLE
RV204 1KB
RV205 20KB
VAR DC BAL
Q205 2SA1206
Q206 2SA1206
Q207 2SA838
Q208 2SA838
R250 22
R251 22
R252 150
R253 150
R254 82
RV209 5008
C271 ~50p
RV106 100
X-GNN
R154 22
R157 220
R150 22
R152 150
RV109 5008
C171 ~50p
R153 150
R151 22
CH2 INPUT
J-3C
P-3
S202
S201-1
S201-2
S201-3
C201 0.022µ AC 630V
R201 47
C211 0.0022µ 400V
R211 470K VR
R202 33
R203 1MF 1/2
QCR201 2SC1907
R212 1K
U201 LF13741N
RV201 20KB
STEP BAL
C212 0.01µ
Q201 2SK107
Q202 2SC945
Q203 2SA844
Q204 2SC945
C213 1000p
C214 1000p
C215 0.01µ
C217 15p
C219 10p
R213 1K
R214 390
R215 100
R216 680
R217 3.9K
R218 8.2K
R219 5.6K
R220 12K
R221 10
R222 10
R223 ATT-1 R-NET WORK
R224 50 -22A
C216 10µ 50WV
S201 -3
+12V
-12V
VOLTS / DIV VARIABLE [PULL x5MAG]

Fig. 3.24


CH1 SIGNAL OUTPUT
CH1 SIGNAL OUT DC OFFSET
CH1 TRIG and X-AXIS DC OFFSET
CH1 POSITION
CH1 GAIN
CH2 POSITION PULL INV
CH2 GAIN
CH2 TRIG DC OFFSET
S302 VERT MODE SWITCH
CHOPD BRK SIGNAL to P-20
ALT PULSE from P-24 NO.1
INT TRIG
INT TRIG OUTPUT
X-Y SWITCH to J-15
R320 10K R-NETWORK
KIKUSUI ELECTRONICS CORPORATION
COS5021TM VERT AMP
321909

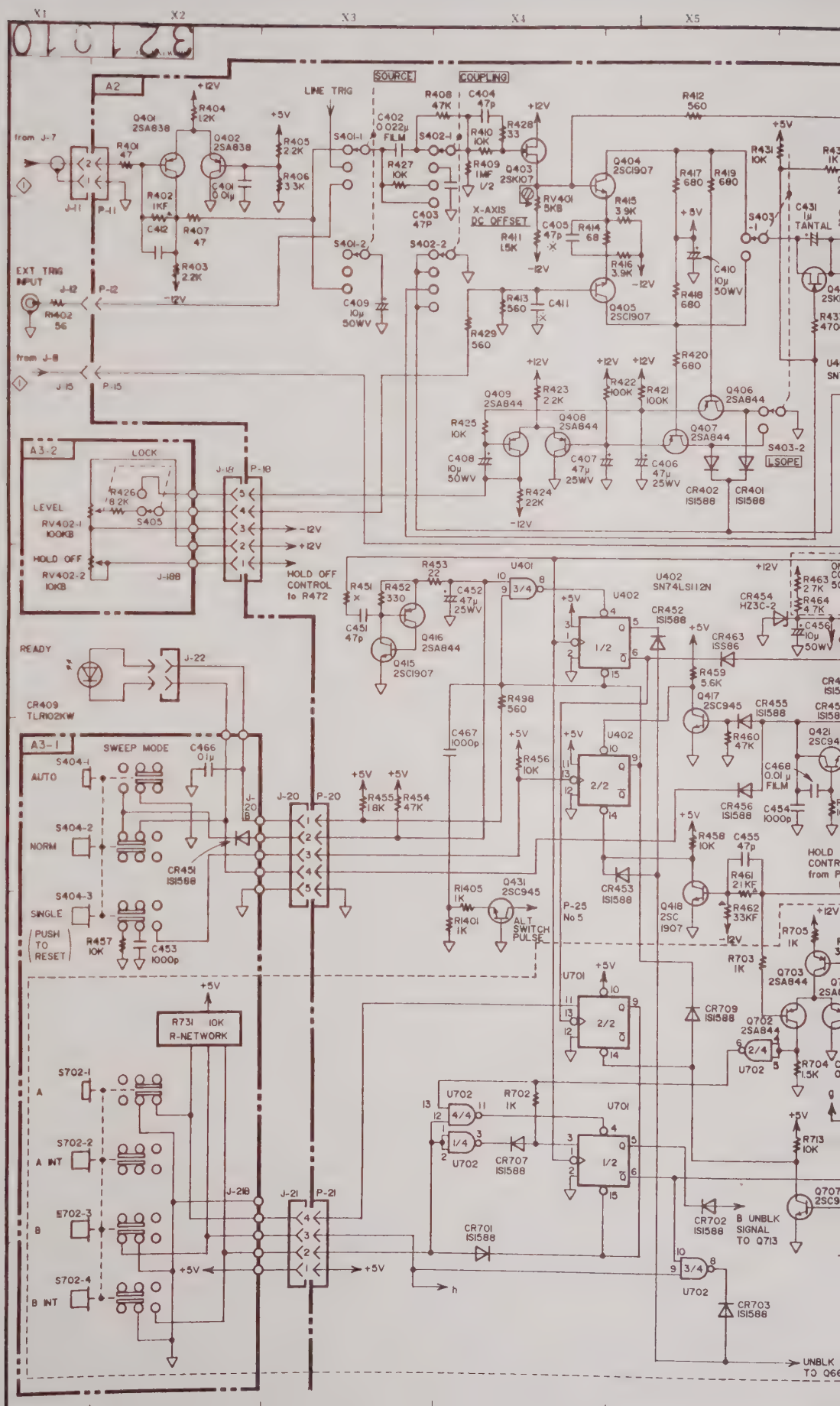
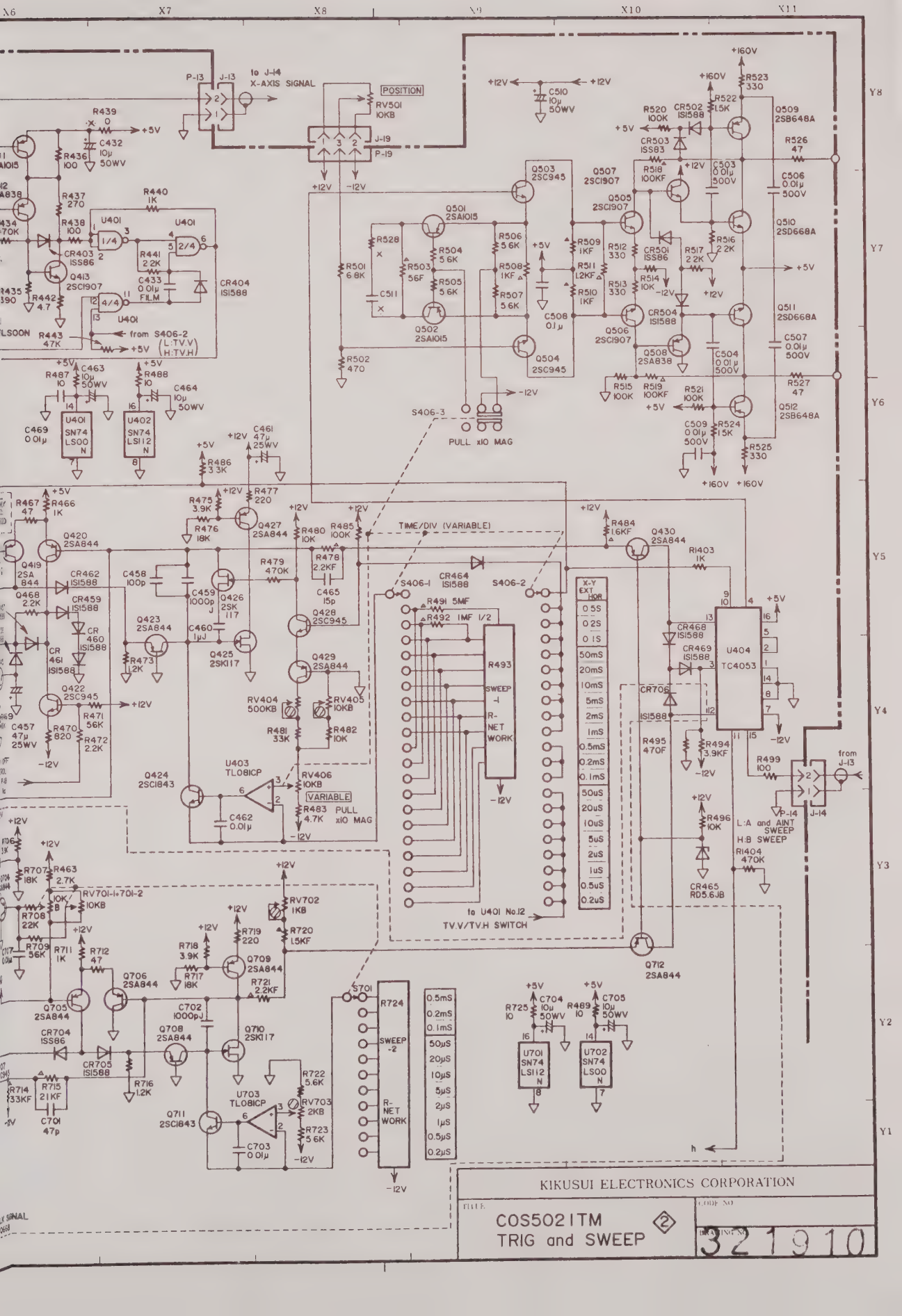

A2
SOURCE
COUPLING
LINE TRIG
X-AXIS DC OFFSET
EXT TRIG INPUT
A3-2
LOCK
LEVEL
HOLD OFF
HOLD OFF CONTROL to R472
READY
CR409 TLR102KW
A3-1
SWEEP MODE
AUTO
NORM
SINGLE
PUSH TO RESET
R731 10K R-NETWORK
A
A INT
B
B INT
LSOPE
ALT SWITCH PULSE
B UNBLK SIGNAL TO Q713
UNBLK TO Q66
SN74LS112N

Fig. 3.25


X6
X7
X8
X9
X10
X11
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1
P-13
J-13
to J-14
X-AXIS SIGNAL
POSITION
RV501
10KB
J-19
P-19
+12V
-12V
+5V
+160V
C510
10µ
50WV
R523
330
R522
1.5K
R520
100K
CR502
ISI588
Q509
2SB648A
CR503
ISS83
R526
47
R518
100KF
C503
0.01µ
500V
C506
0.01µ
500V
Q507
2SC1907
Q505
2SC1907
Q503
2SC945
Q501
2SA1015
R528
X
R501
6.8K
C511
X
R503
56F
R504
5.6K
R505
5.6K
R506
5.6K
R507
5.6K
R508
1KF
R509
1KF
R511
1.2KF
R510
1KF
R512
330
R513
330
CR501
ISS86
R514
10K
R517
2.2K
R516
2.2K
Q510
2SD668A
Q511
2SD668A
CR504
ISI588
Q506
2SC1907
Q508
2SA838
C504
0.01µ
500V
C507
0.01µ
500V
R527
47
R515
100K
R519
100KF
R521
100K
Q512
2SB648A
C509
0.01µ
500V
R524
1.5K
R525
330
Q502
2SA1015
Q504
2SC945
C508
0.1µ
R502
470
S406-3
PULL x10 MAG
R439
0
C432
10µ
50WV
R436
100
R437
270
R438
100
R440
1K
U401
1/4
2/4
4/4
R441
2.2K
C433
0.01µ
FILM
CR404
ISI588
Q413
2SC1907
R442
4.7
R435
390
R443
47K
from S406-2
(L:TV.V
H:TV.H)
R487
10
C463
10µ
50WV
R488
10
C464
10µ
50WV
C469
0.01µ
U401
SN74
LS00
N
U402
SN74
LS112
N
C461
47µ
25WV
R486
3.3K
R475
3.9K
R476
18K
R477
220
Q427
2SA844
R480
10K
R485
100K
R478
2.2KF
C465
15p
TIME/DIV (VARIABLE)
R484
1.6KF
Q430
2SA844
R1403
1K
R467
47
R466
1K
Q420
2SA844
Q419
2SA844
CR462
ISI588
CR459
ISI588
CR460
ISI588
CR461
ISI588
Q468
2.2K
C458
100p
C459
1000p
J
Q426
2SK117
C460
1µJ
R479
470K
Q423
2SA844
R473
1.2K
Q425
2SK117
Q428
2SC945
Q429
2SA844
RV404
500KB
RV405
10KB
R481
33K
R482
10K
Q424
2SC1843
U403
TL081CP
RV406
10KB
VARIABLE
R483
4.7K
PULL
x10 MAG
C462
0.01µ
S406-1
S406-2
CR464
ISI588
R491 5MF
R492 1MF 1/2
R493
SWEEP
-1
R-
NET
WORK
X-Y
EXT
HOR
0.5S
0.2S
0.1S
50mS
20mS
10mS
5mS
2mS
1mS
0.5mS
0.2mS
0.1mS
50uS
20uS
10uS
5uS
2uS
1uS
0.5uS
0.2uS
to U401 No.12
TV.V/TV.H SWITCH
U404
TC4053
CR468
ISI588
CR469
ISI588
CR706
ISI588
R495
470F
R494
3.9KF
R499
100
from
J-13
P-14
J-14
L:A and AINT
SWEEP
H:B SWEEP
R496
10K
R1404
470K
CR465
RD5.6JB
Q712
2SA844
R707
18K
R463
2.7K
RV701-1,701-2
10KB
R708
22K
R709
36K
R711
1K
R712
47
Q706
2SA844
Q705
2SA844
CR704
ISS86
CR705
ISI588
R714
33KF
R715
21KF
C701
47p
R716
1.2K
C702
1000p
Q708
2SA844
Q710
2SK117
U703
TL081CP
Q711
2SC1843
RV702
1KB
R719
220
R720
1.5KF
R718
3.9K
R717
18K
Q709
2SA844
R721
2.2KF
R722
5.6K
RV703
2KB
R723
5.6K
C703
0.01µ
S701
R724
SWEEP
-2
R-
NET
WORK
0.5mS
0.2mS
0.1mS
50µS
20µS
10µS
5µS
2µS
1µS
0.5µS
0.2µS
R725
10
C704
10µ
50WV
R489
10
C705
10µ
50WV
U701
SN74
LS112
N
U702
SN74
LS00
N
KIKUSUI ELECTRONICS CORPORATION
FILE
COS5021TM
TRIG and SWEEP
②
CODE NO
DRAWING NO
321910

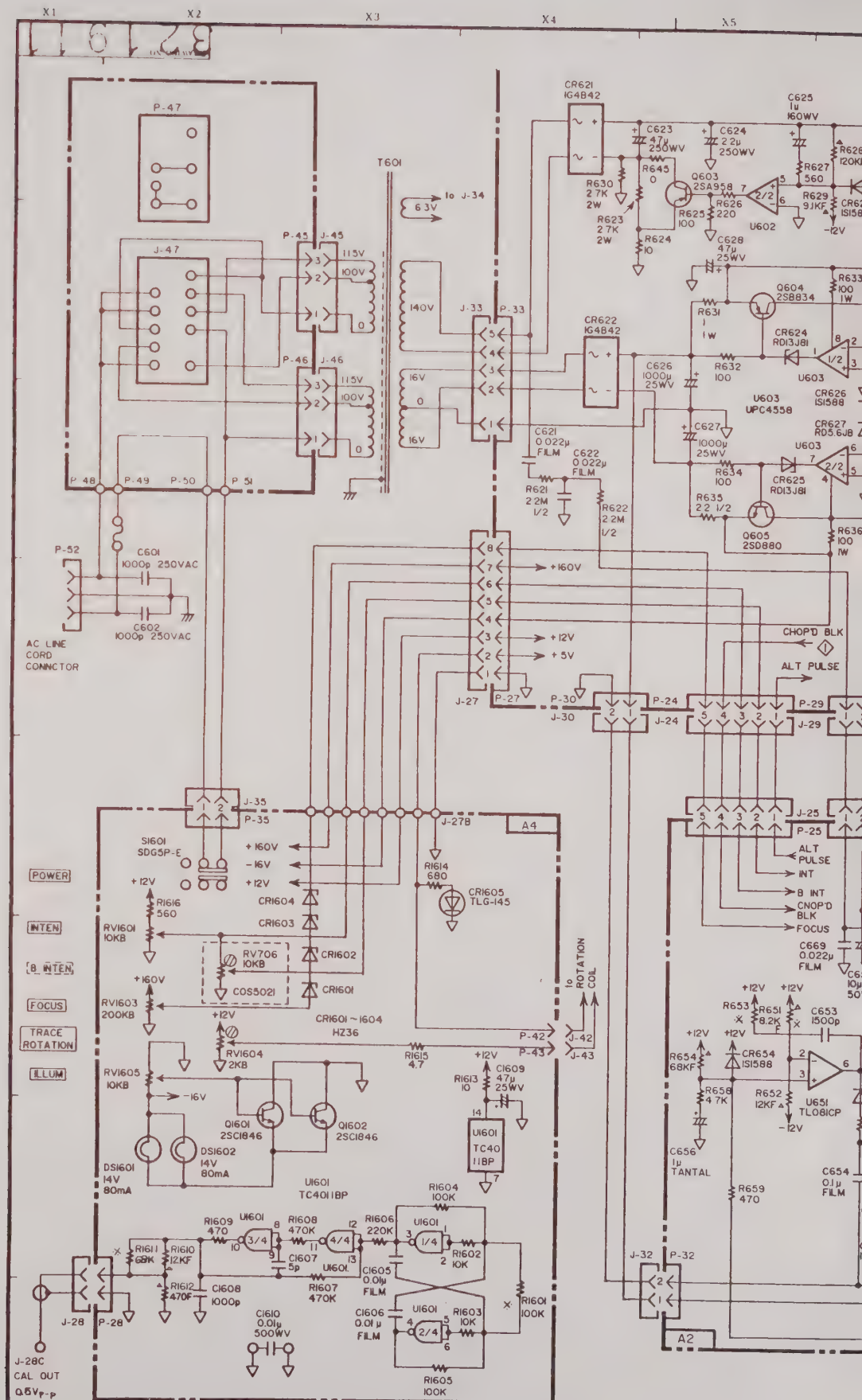
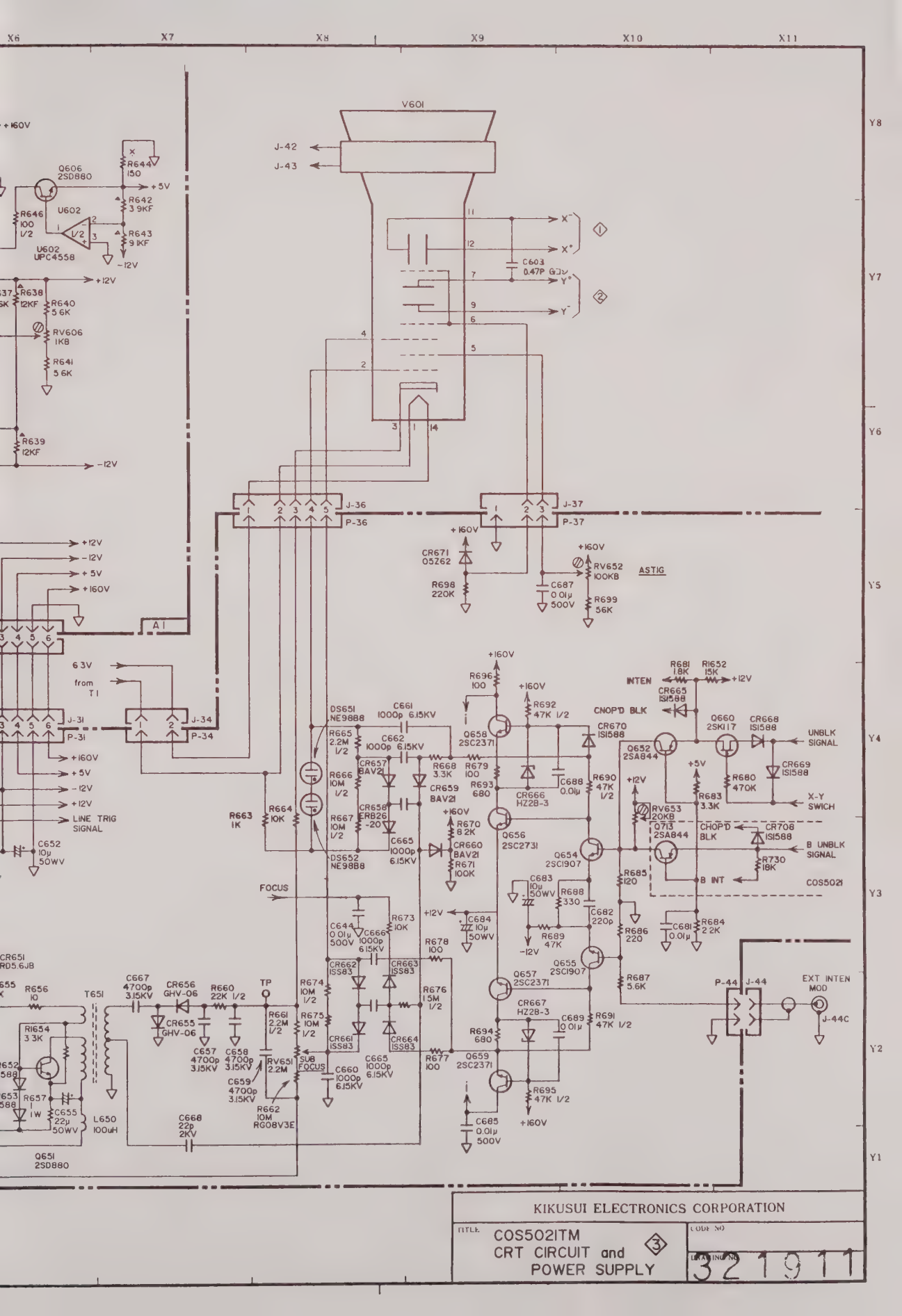

X1
X2
X3
X4
X5
P-47
J-47
T601
to J-34
6.3V
P-45
J-45
115V
100V
0
P-46
J-46
115V
100V
0
140V
16V
0
16V
J-33
P-33
P 48
P-49
P-50
P 51
P-52
C601
1000p 250VAC
C602
1000p 250VAC
AC LINE
CORD
CONNCTOR
CR621
IG4B42
CR622
IG4B42
C623
47µ
250WV
C624
2.2µ
250WV
C625
1µ
160WV
R626
120K
R627
560
R629
9.1KF
R630
27K
2W
R623
27K
2W
R645
0
R624
10
R625
100
R626
220
Q603
2SA958
U602
C628
47µ
25WV
Q604
2S8834
R633
100
1W
R631
1
1W
CR624
RD13J81
U603
R632
100
C626
1000µ
25WV
U603
UPC4558
CR626
1SI588
C627
1000µ
25WV
CR627
RD5.6JB
U603
R634
100
CR625
RD13J81
R635
2.2 1/2
Q605
2SD880
R636
100
1W
C621
0.022µ
FILM
C622
0.022µ
FILM
R621
2.2M
1/2
R622
2.2M
1/2
+160V
+12V
+5V
CHOP'D BLK
ALT PULSE
J-27
P-27
P-30
J-30
P-24
J-24
P-29
J-29
J-35
P-35
J-27B
A4
SI601
SDG5P-E
+160V
-16V
+12V
POWER
INTEN
B INTEN
FOCUS
TRACE
ROTATION
ILLUM
R1616
560
RV1601
10KB
RV1603
200KB
RV1604
2KB
RV1605
10KB
RV706
10KB
COS5021
CR1604
CR1603
CR1602
CR1601
CR1601 ~ 1604
HZ36
R1614
680
CR1605
TLG-145
to ROTATION COIL
J-42
J-43
P-42
P-43
R1615
4.7
R1613
10
C1609
47µ
25WV
Q1601
2SC1846
Q1602
2SC1846
DS1601
14V
80mA
DS1602
14V
80mA
U1601
TC40 11BP
R1604
100K
R1609
470
R1608
470K
R1606
220K
R1611
68K
R1610
12KF
R1612
470F
C1608
1000p
C1607
5p
R1607
470K
C1605
0.01µ
FILM
R1602
10K
C1606
0.01µ
FILM
R1603
10K
R1601
100K
R1605
100K
C1610
0.01µ
500WV
J-28
P-28
J-28C
CAL OUT
0.5Vp-p
J-25
P-25
ALT PULSE
INT
B INT
CHOP'D BLK
FOCUS
C669
0.022µ
FILM
R653
8.2K
F
C653
1500p
R654
68KF
CR654
1SI588
R658
4.7K
R652
12KF
U651
TL081CP
C656
1µ
TANTAL
R659
470
C654
0.1µ
FILM
J-32
P-32
A2

Fig. 3.26


X6
X7
X8
X9
X10
X11
Y8
Y7
Y6
Y5
Y4
Y3
Y2
Y1
V601
J-42
J-43
J-36
P-36
J-37
P-37
J-31
P-31
J-34
P-34
A1
+160V
+12V
-12V
+5V
6.3V
from T1
LINE TRIG SIGNAL
FOCUS
ASTIG
INTEN
CHOP'D BLK
UNBLK SIGNAL
X-Y SWICH
B UNBLK SIGNAL
B INT
COS502I
EXT INTEN MOD
J-44C
P-44
J-44
TP
T651
L650 100uH
Q606 2SD880
Q651 2SD880
U602 UPC4558
Q652 2SA844
Q653 2SA844
Q654 2SC1907
Q655 2SC1907
Q656 2SC2731
Q657 2SC2371
Q658 2SC2371
Q659 2SC2371
Q660 2SK117
KIKUSUI ELECTRONICS CORPORATION
TITLE
COS502ITM
CRT CIRCUIT and
POWER SUPPLY
CODE NO
DRAWING NO
32191 1

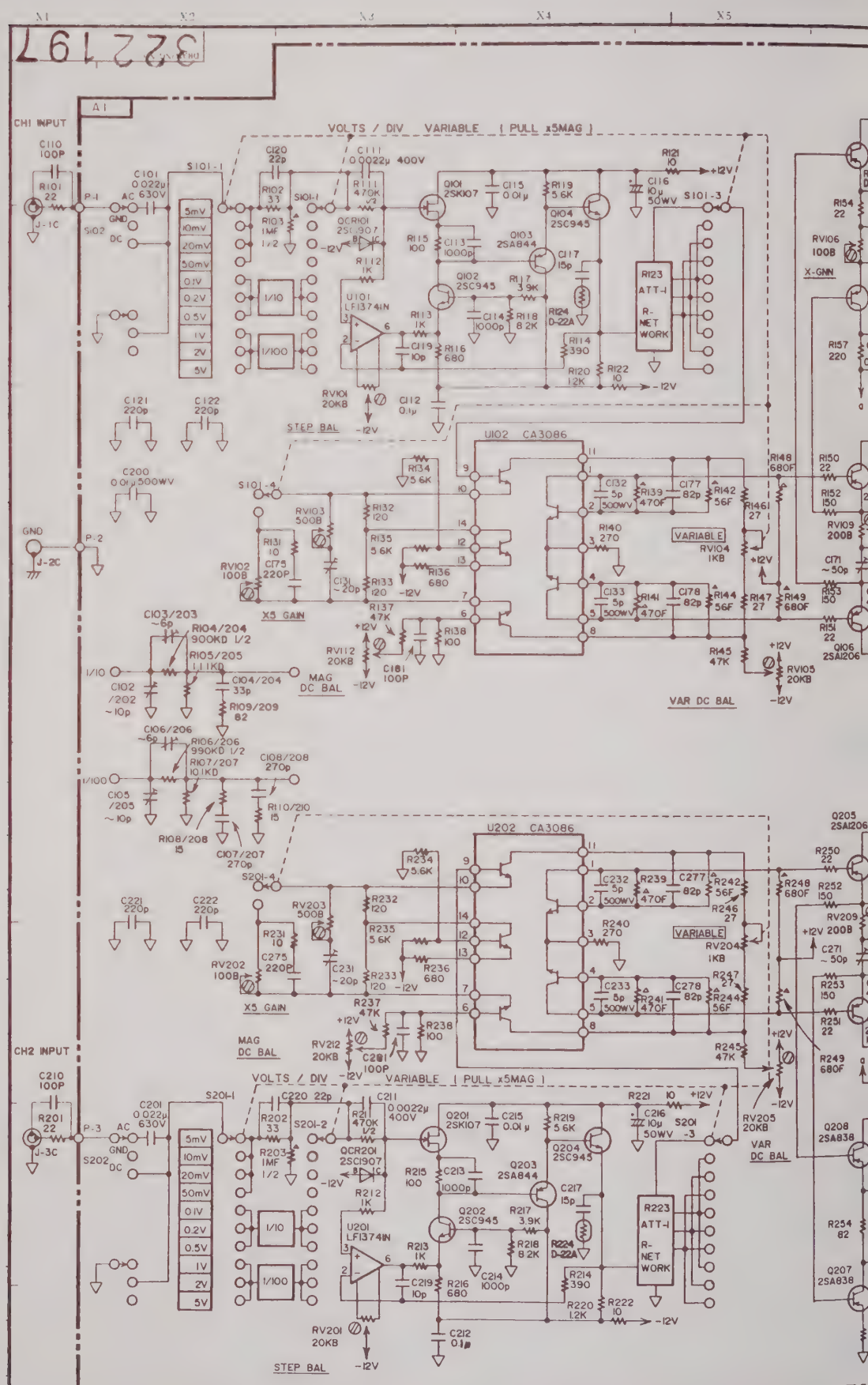
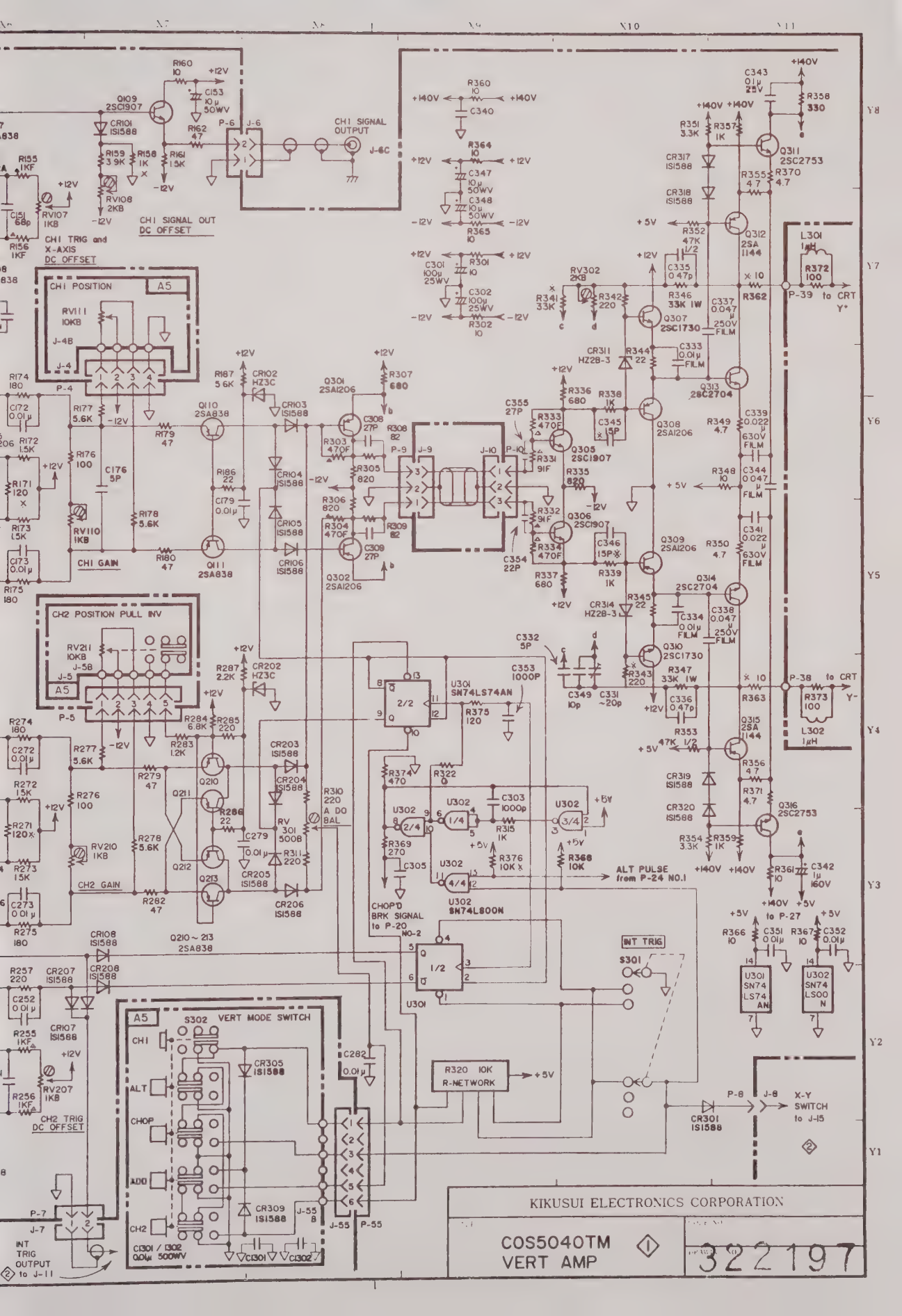

CH1 INPUT
VOLTS / DIV VARIABLE (PULL x5MAG)
U102 CA3086
X5 GAIN
MAG DC BAL
VAR DC BAL
STEP BAL
VARIABLE
U202 CA3086
CH2 INPUT
VOLTS / DIV VARIABLE (PULL x5MAG)
STEP BAL

Fig. 3.27


CH1 SIGNAL OUTPUT
CH1 SIGNAL OUT DC OFFSET
CH1 TRIG and X-AXIS DC OFFSET
CH1 POSITION
CH1 GAIN
CH2 POSITION PULL INV
CH2 GAIN
CH2 TRIG DC OFFSET
S302 VERT MODE SWITCH
CHOP'D BRK SIGNAL to P-20 NO-2
ALT PULSE from P-24 NO.1
INT TRIG
INT TRIG OUTPUT to J-11
X-Y SWITCH to J-15
KIKUSUI ELECTRONICS CORPORATION
COS5040TM
VERT AMP
322197

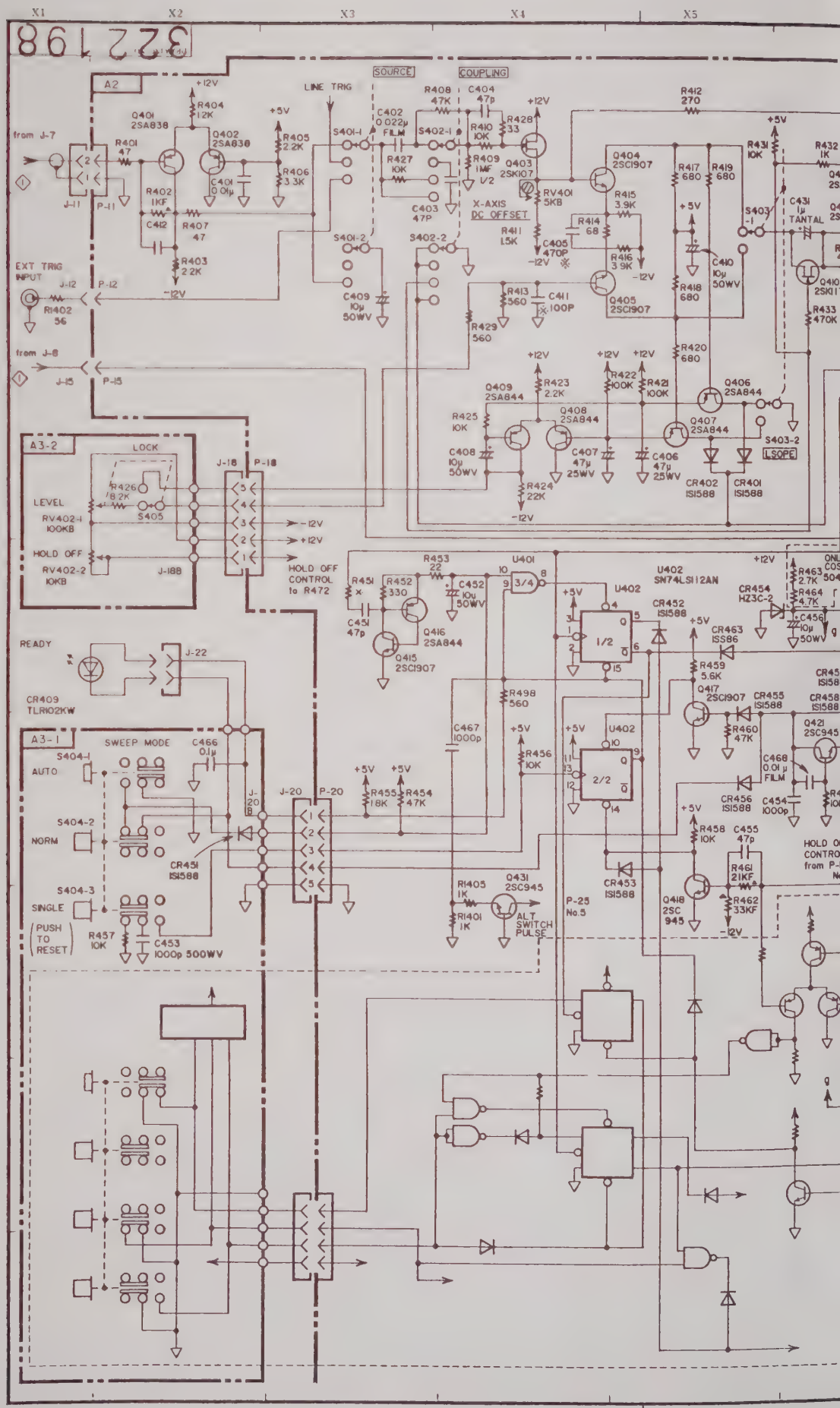
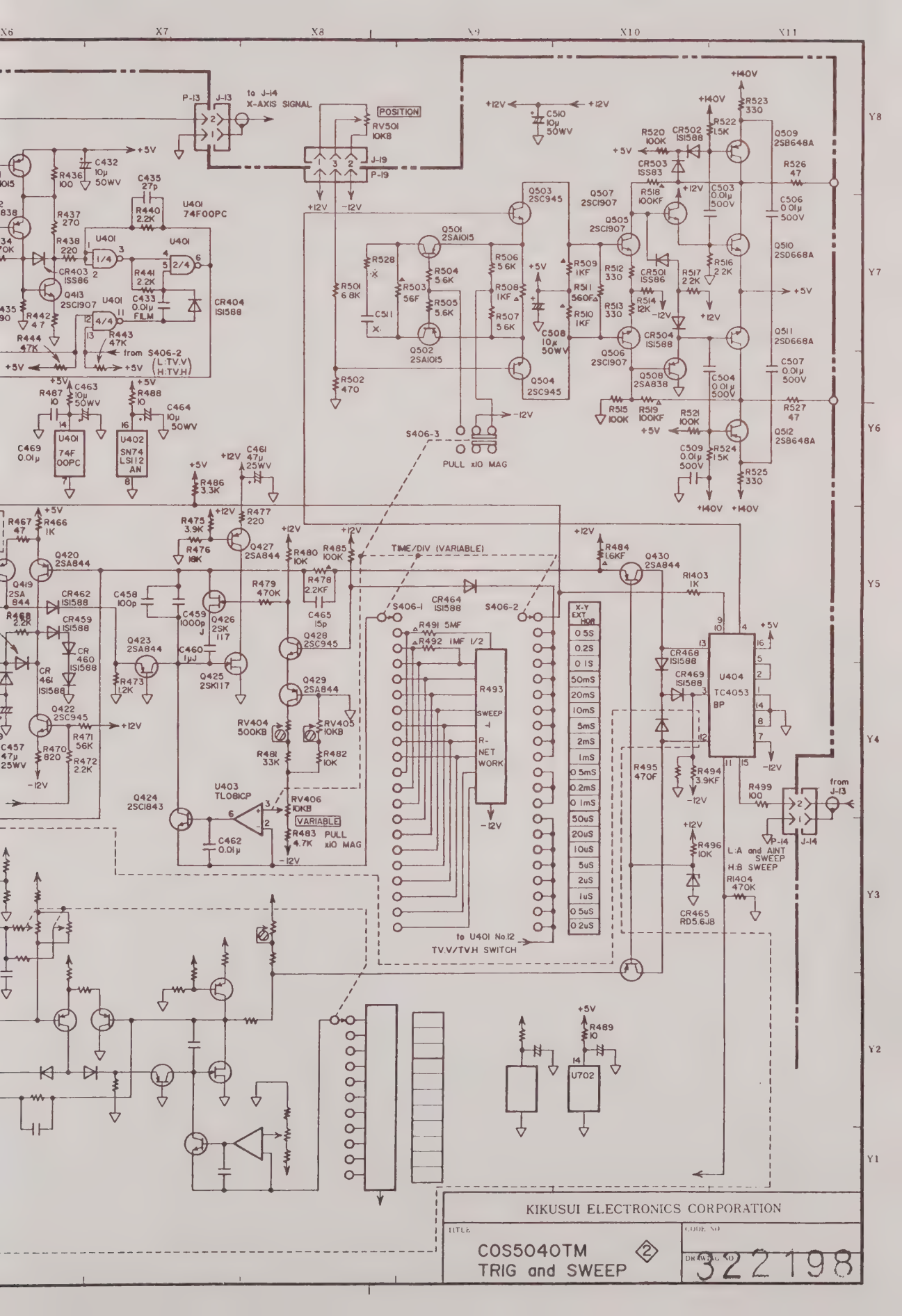

X1
X2
X3
X4
X5
A2
SOURCE
COUPLING
LINE TRIG
+12V
+5V
-12V
Q401 2SA838
Q402 2SA838
Q403 2SK107
Q404 2SC1907
Q405 2SC1907
Q406 2SA844
Q407 2SA844
Q408 2SA844
Q409 2SA844
Q410 2SK11
Q415 2SC1907
Q416 2SA844
Q417 2SC1907
Q418 2SC 945
Q421 2SC945
Q431 2SC945
R401 47
R402 1KF
R403 2.2K
R404 12K
R405 2.2K
R406 3.3K
R407 47
R408 47K
R409 1MF
R410 10K
R411 1.5K
R412 270
R413 560
R414 68
R415 3.9K
R416 3.9K
R417 680
R418 680
R419 680
R420 680
R421 100K
R422 100K
R423 2.2K
R424 22K
R425 10K
R427 10K
R428 33
R429 560
R431 10K
R432 1K
R433 470K
R451 X
R452 330
R453 22
R455 18K
R456 10K
R457 10K
R458 10K
R459 5.6K
R460 47K
R461 21KF
R462 33KF
R463 2.7K
R464 4.7K
R498 560
R1401 1K
R1402 56
R1403 1K
RV401 5KB
RV402-1 100KB
RV402-2 10KB
C401 0.01µ
C402 0.022µ FILM
C403 47P
C404 47p
C405 470P
C406 47µ 25WV
C407 47µ 25WV
C408 10µ 50WV
C409 10µ 50WV
C410 10µ 50WV
C411 100P
C412
C431 1µ TANTAL
C451 47p
C452 10µ 50WV
C453 1000p 500WV
C454 1000p
C455 47p
C456 10µ 50WV
C466 0.1µ
C467 1000p
C468 0.01µ FILM
U401
U402 SN74LS112AN
1/2
2/2
3/4
CR401 IS1588
CR402 IS1588
CR451 IS1588
CR452 IS1588
CR453 IS1588
CR454 HZ3C-2
CR455 IS1588
CR456 IS1588
CR458 IS1588
CR463 ISS86
CR409 TLR102KW
A3-1
A3-2
SWEEP MODE
AUTO
NORM
SINGLE
PUSH TO RESET
S404-1
S404-2
S404-3
LOCK
LEVEL
HOLD OFF
S405
S401-1
S401-2
S402-1
S402-2
S403-1
S403-2
SLOPE
X-AXIS DC OFFSET
EXT TRIG INPUT
READY
ALT SWITCH PULSE
HOLD OFF CONTROL to R472
from J-7
from J-8
J-11
J-12
J-15
J-18
J-18B
J-20
J-20B
J-22
P-11
P-12
P-15
P-18
P-20
P-25 No.5
3227198

Fig. 3.28



KIKUSUI ELECTRONICS CORPORATION

TITLE: COS5040TM TRIG and SWEEP ②

CODE NO.

DRAWING NO. 322198

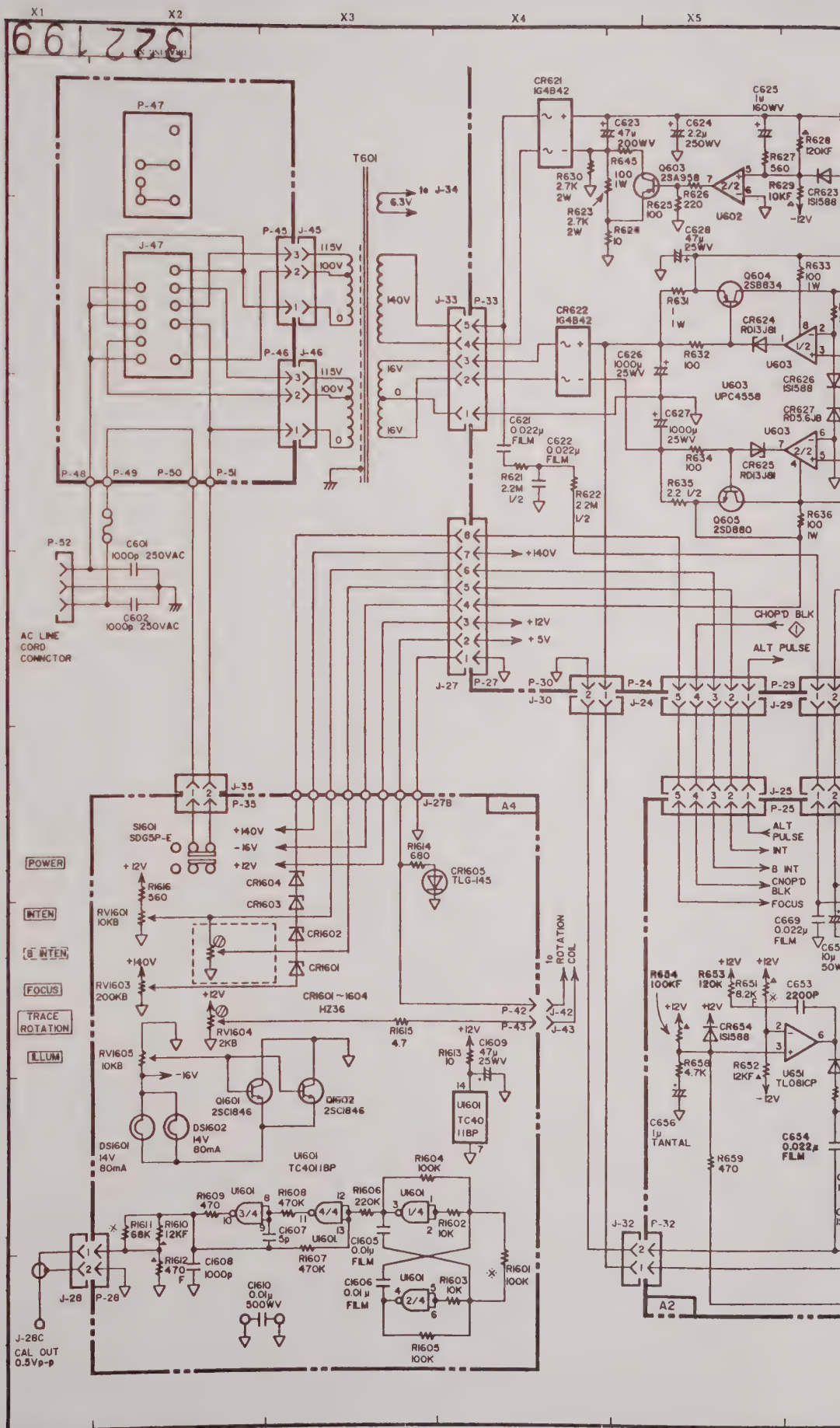
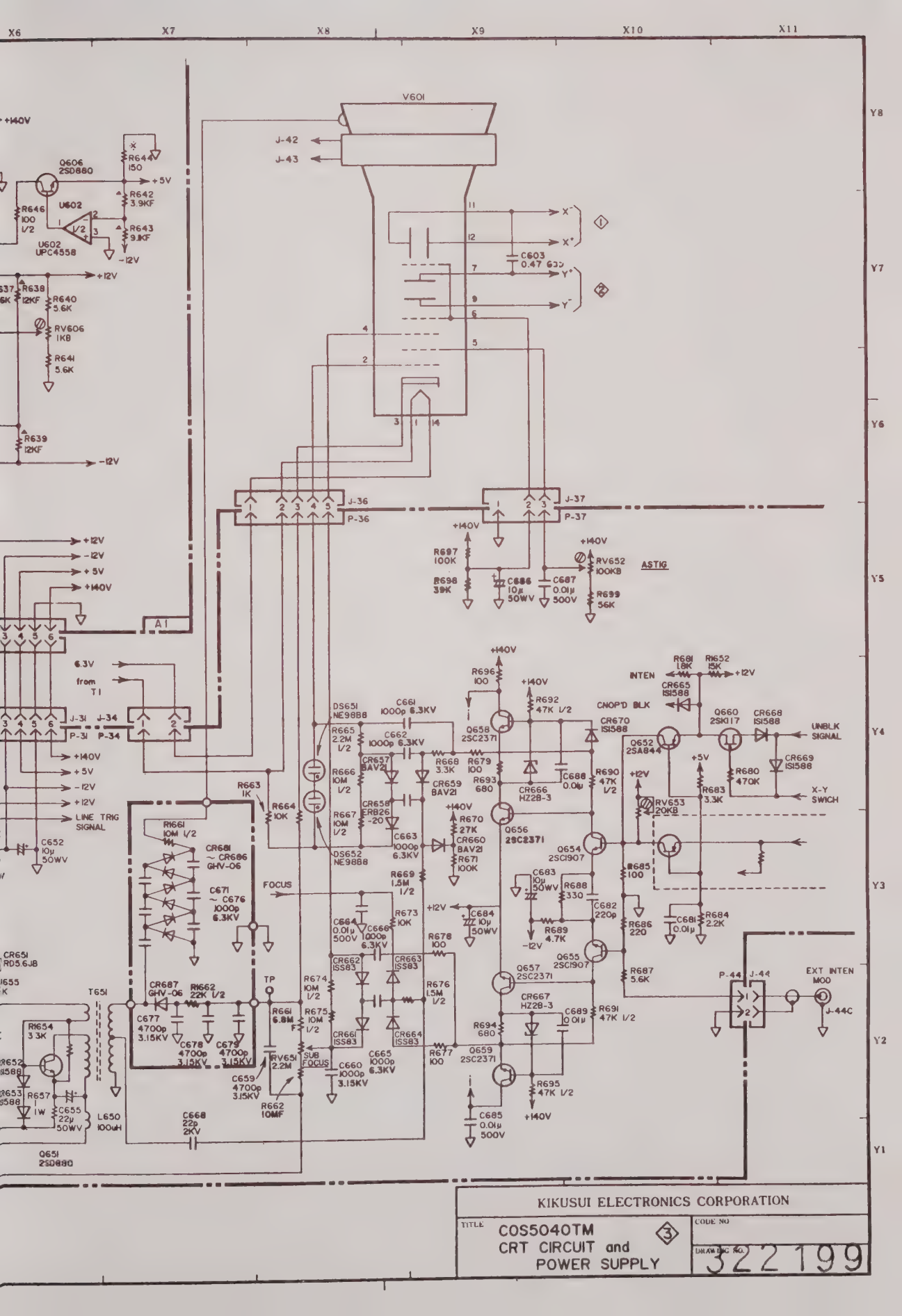

X1
X2
X3
X4
X5
3227199
P-47
J-47
T601
to J-34
6.3V
P-45
J-45
115V
100V
140V
16V
P-46
J-46
J-33
P-33
P-48
P-49
P-50
P-51
P-52
C601
1000p 250VAC
C602
1000p 250VAC
AC LINE
CORD
CONNCTOR
CR621
IG4B42
CR622
IG4B42
C623
47µ
200WV
C624
2.2µ
250WV
C625
1µ
160WV
R627
560
R628
120KF
R629
10KF
CR623
ISI588
-12V
R630
2.7K
2W
R623
2.7K
2W
R645
100
1W
Q603
2SA958
R625
100
R626
220
U602
R624
10
C628
47µ
25WV
Q604
2SB834
R631
1W
R633
100
1W
CR624
RD13J81
R632
100
U603
U603
UPC4558
CR626
ISI588
C626
1000µ
25WV
C627
1000µ
25WV
CR627
RD3.6J8
R634
100
CR625
RD13J81
R635
2.2 1/2
Q605
2SD880
R636
100
1W
C621
0.022µ
FILM
C622
0.022µ
FILM
R621
2.2M
1/2
R622
2.2M
1/2
+140V
+12V
+5V
CHOP'D BLK
ALT PULSE
J-27
P-27
P-30
J-30
P-24
J-24
P-29
J-29
J-35
P-35
J-278
A4
J-25
P-25
ALT
PULSE
INT
B INT
CHOP'D
BLK
FOCUS
SI601
SDG5P-E
+140V
-16V
+12V
POWER
INTEN
B INTEN
FOCUS
TRACE
ROTATION
ILLUM
R1616
560
RV1601
10KB
RV1603
200KB
RV1604
2KB
RV1605
10KB
CR1604
CR1603
CR1602
CR1601
CR1601~1604
HZ36
R1614
680
CR1605
TLG-145
to ROTATION COIL
P-42
P-43
J-42
J-43
R1615
4.7
Q1601
2SC1846
Q1602
2SC1846
DS1602
14V
80mA
DS1601
14V
80mA
R1613
10
C1609
47µ
25WV
U1601
TC4011BP
R654
100KF
R653
120K
R651
8.2K
C653
2200P
R654
ISI588
R658
4.7K
R652
12KF
U651
TL081CP
C656
1µ
TANTALUM
C654
0.022µ
FILM
R659
470
R1604
100K
R1609
470
R1608
470K
R1606
220K
R1602
10K
C1607
5p
R1607
470K
C1605
0.01µ
FILM
R1611
68K
R1610
12KF
R1612
470
F
C1608
1000p
C1606
0.01µ
FILM
R1603
10K
R1601
100K
C1610
0.01µ
500WV
R1605
100K
J-28
P-28
J-28C
CAL OUT
0.5Vp-p
J-32
P-32
A2

Fig. 3.29



KIKUSUI ELECTRONICS CORPORATION

TITLE: COS5040TM ③ CRT CIRCUIT and POWER SUPPLY

CODE NO

DWG NO. 322199

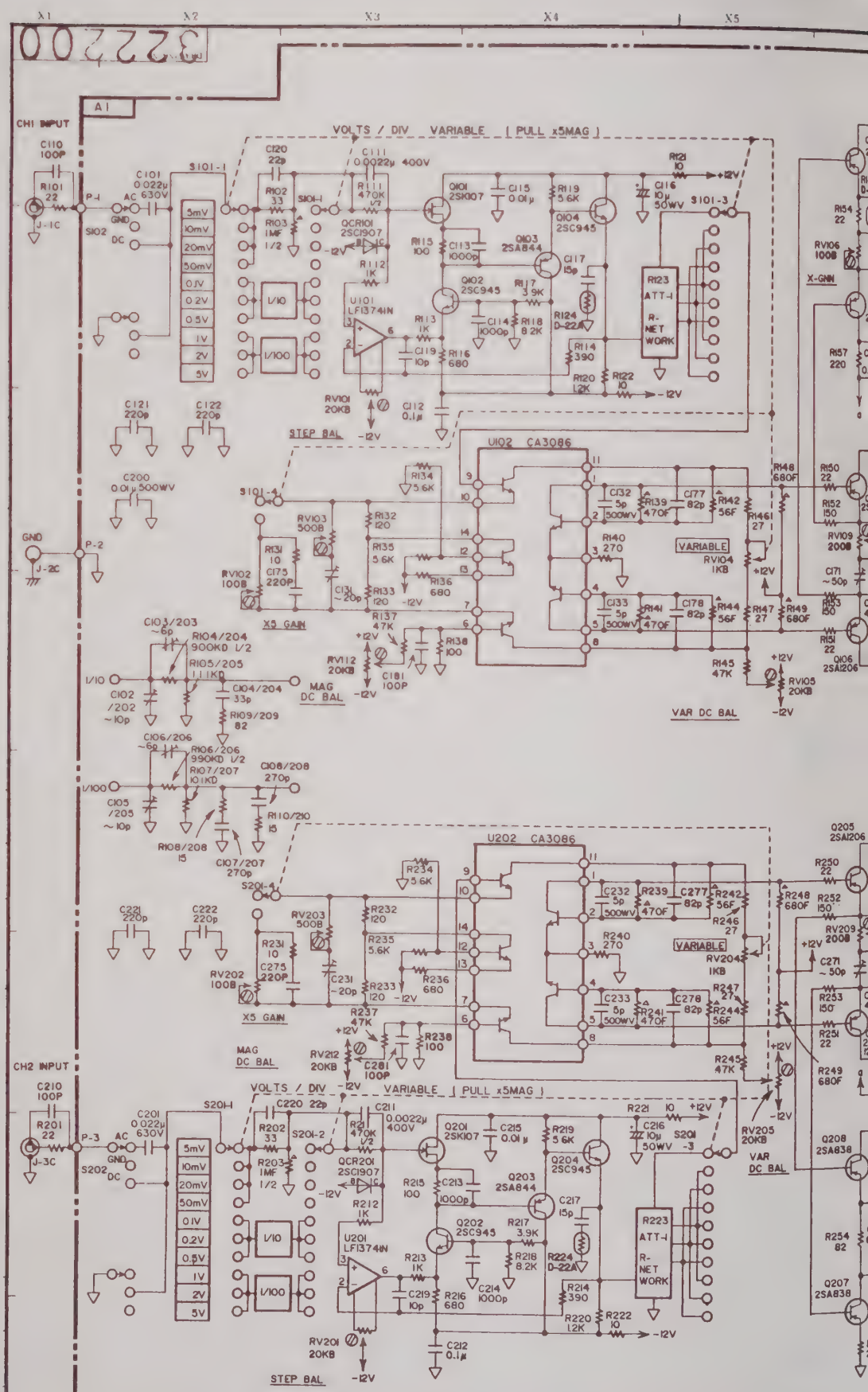
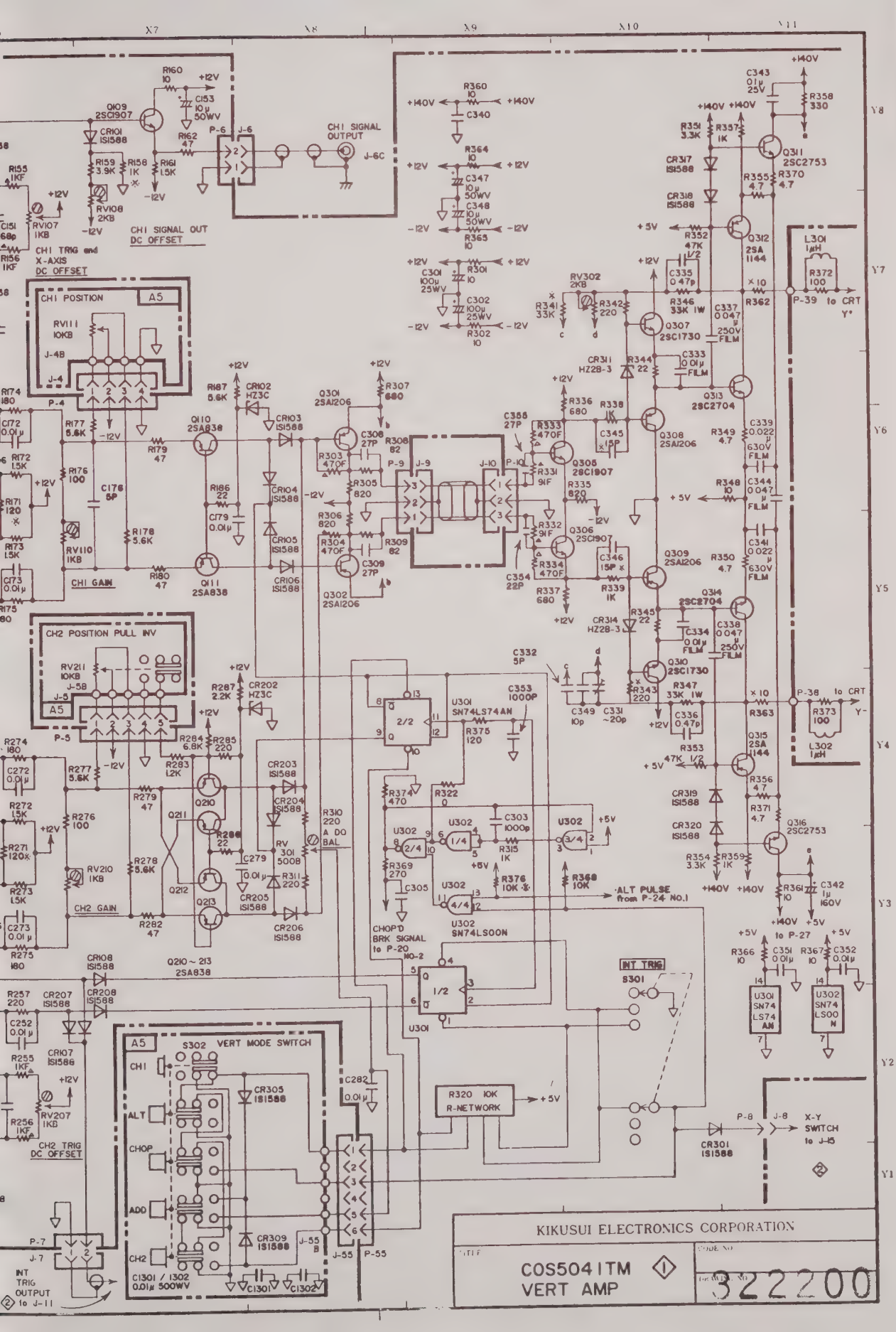

CH1 INPUT
CH2 INPUT
VOLTS / DIV VARIABLE (PULL x5MAG)
STEP BAL
MAG DC BAL
VAR DC BAL
X5 GAIN
U102 CA3086
U202 CA3086
U101 LF13741N
U201 LF13741N
VARIABLE
X-GNN
5mV
10mV
20mV
50mV
0.1V
0.2V
0.5V
1V
2V
5V
1/10
1/100
-12V
+12V

Fig. 3.30


CH1 SIGNAL OUTPUT
CH1 SIGNAL OUT
DC OFFSET
CH1 TRIG and
X-AXIS
DC OFFSET
CH1 POSITION
A5
CH1 GAIN
CH2 POSITION PULL INV
CH2 GAIN
CH2 TRIG
DC OFFSET
S302 VERT MODE SWITCH
CHOP'D
BRK SIGNAL
to P-20
ALT PULSE
from P-24 NO.1
INT TRIG
S301
R320 10K
R-NETWORK
X-Y
SWITCH
to J-15
INT
TRIG
OUTPUT
to J-11
to P-27
to CRT
Y+
to CRT
Y-
KIKUSUI ELECTRONICS CORPORATION
TITLE
COS5041TM
VERT AMP
CODE NO.
322200

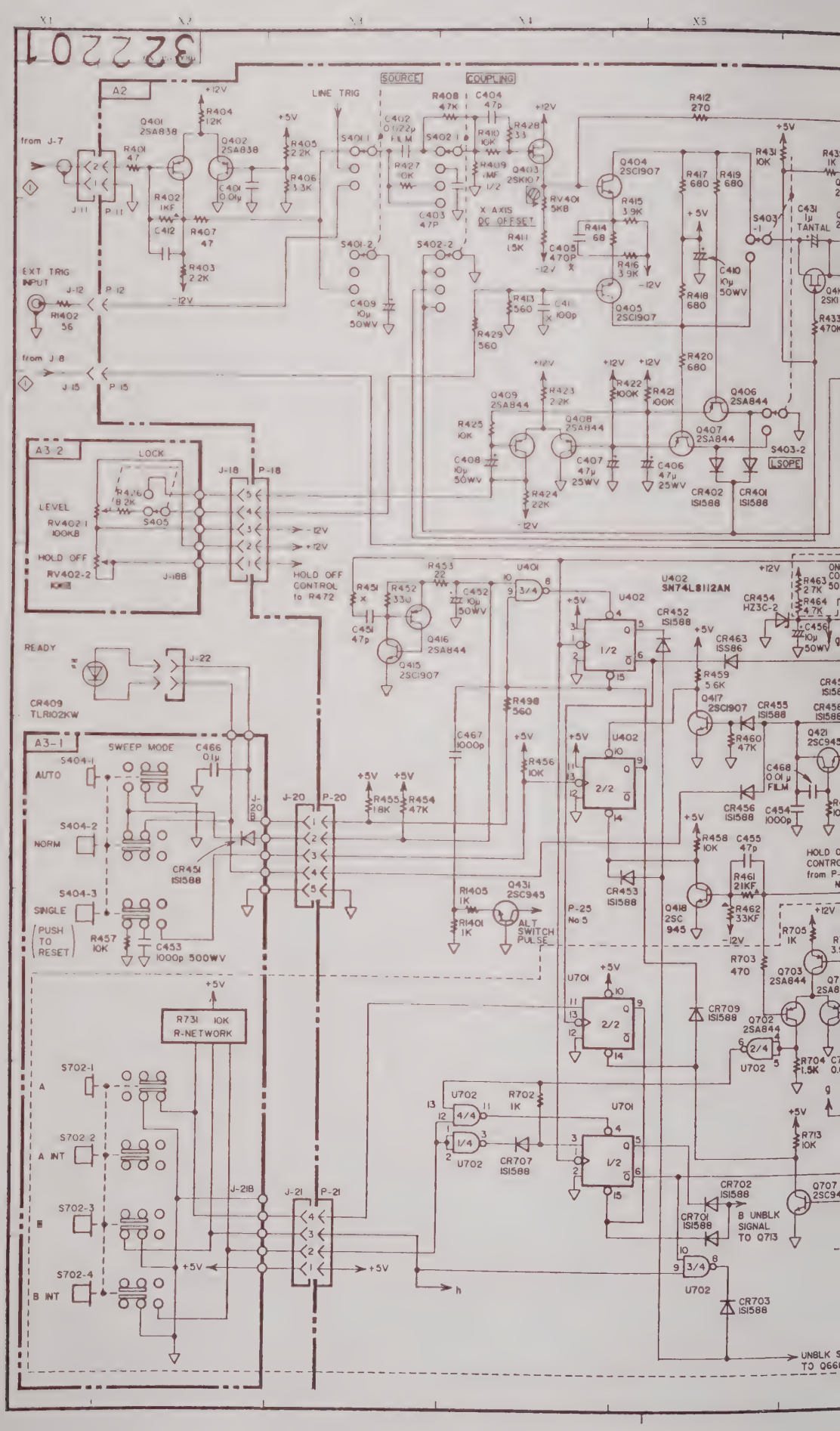
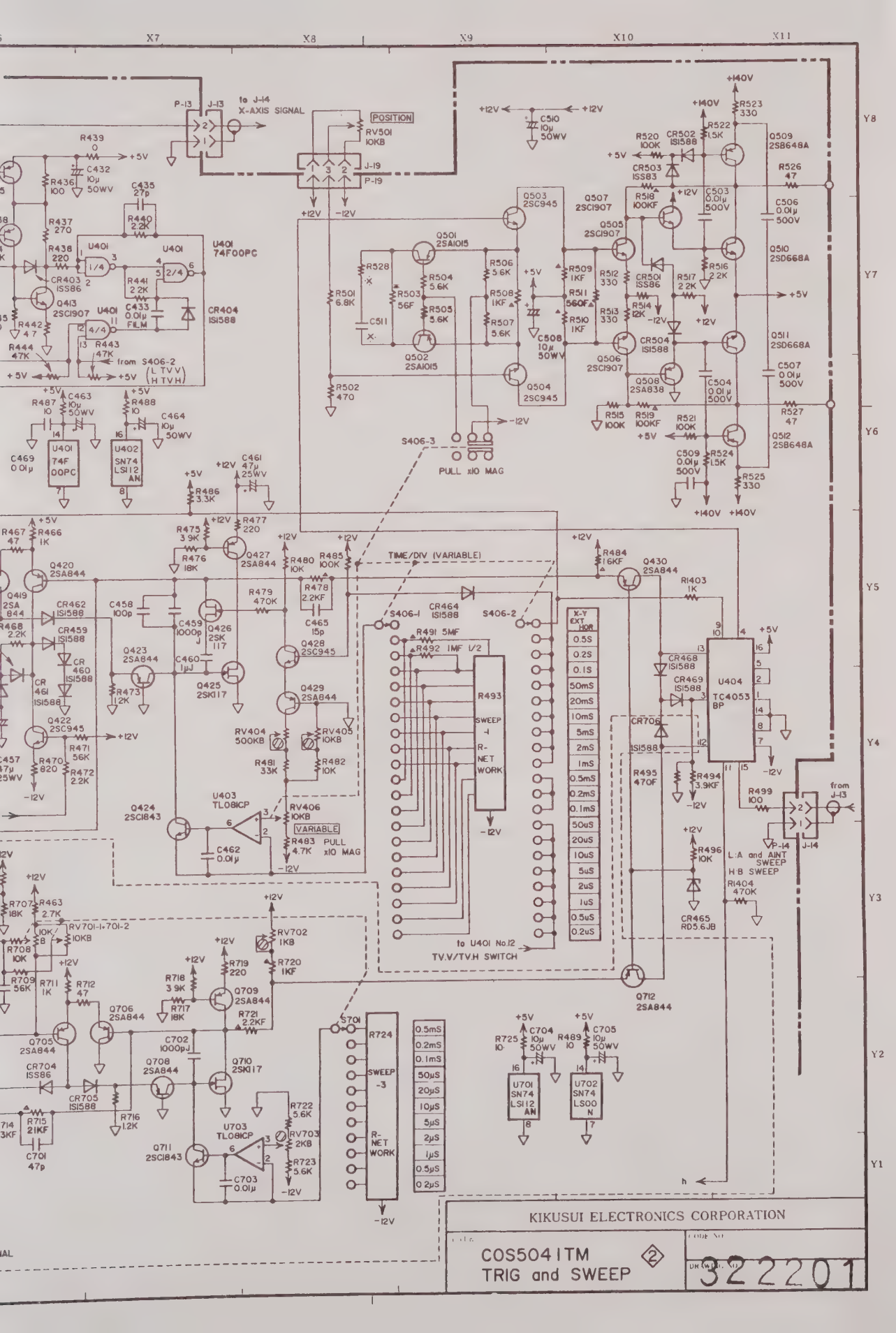

A2
A3-2
A3-1
LOCK
LEVEL
HOLD OFF
READY
CR409
TLR102KW
SWEEP MODE
AUTO
NORM
SINGLE
PUSH TO RESET
R731 10K
R-NETWORK
A
A INT
B
B INT
SOURCE
COUPLING
LINE TRIG
from J-7
EXT TRIG INPUT
from J-8
X AXIS DC OFFSET
HOLD OFF CONTROL to R472
B UNBLK SIGNAL TO Q713
UNBLK S
TO Q66
LSOPE
ALT SWITCH PULSE
U402 SN74LS112AN
U401
U702
U701
Q401 2SA838
Q402 2SA838
Q403 2SK107
Q404 2SC1907
Q405 2SC1907
Q406 2SA844
Q407 2SA844
Q408 2SA844
Q409 2SA844
Q415 2SC1907
Q416 2SA844
Q417 2SC1907
Q418 2SC 945
Q421 2SC945
Q431 2SC945
Q702 2SA844
Q703 2SA844
Q707 2SC94
CR401 ISI588
CR402 ISI588
CR451 ISI588
CR452 ISI588
CR453 ISI588
CR454 HZ3C-2
CR455 ISI588
CR456 ISI588
CR463 ISS86
CR701 ISI588
CR702 ISI588
CR703 ISI588
CR707 ISI588
CR709 ISI588

Fig. 3.31



KIKUSUI ELECTRONICS CORPORATION

COS5041TM
TRIG and SWEEP

2

322201

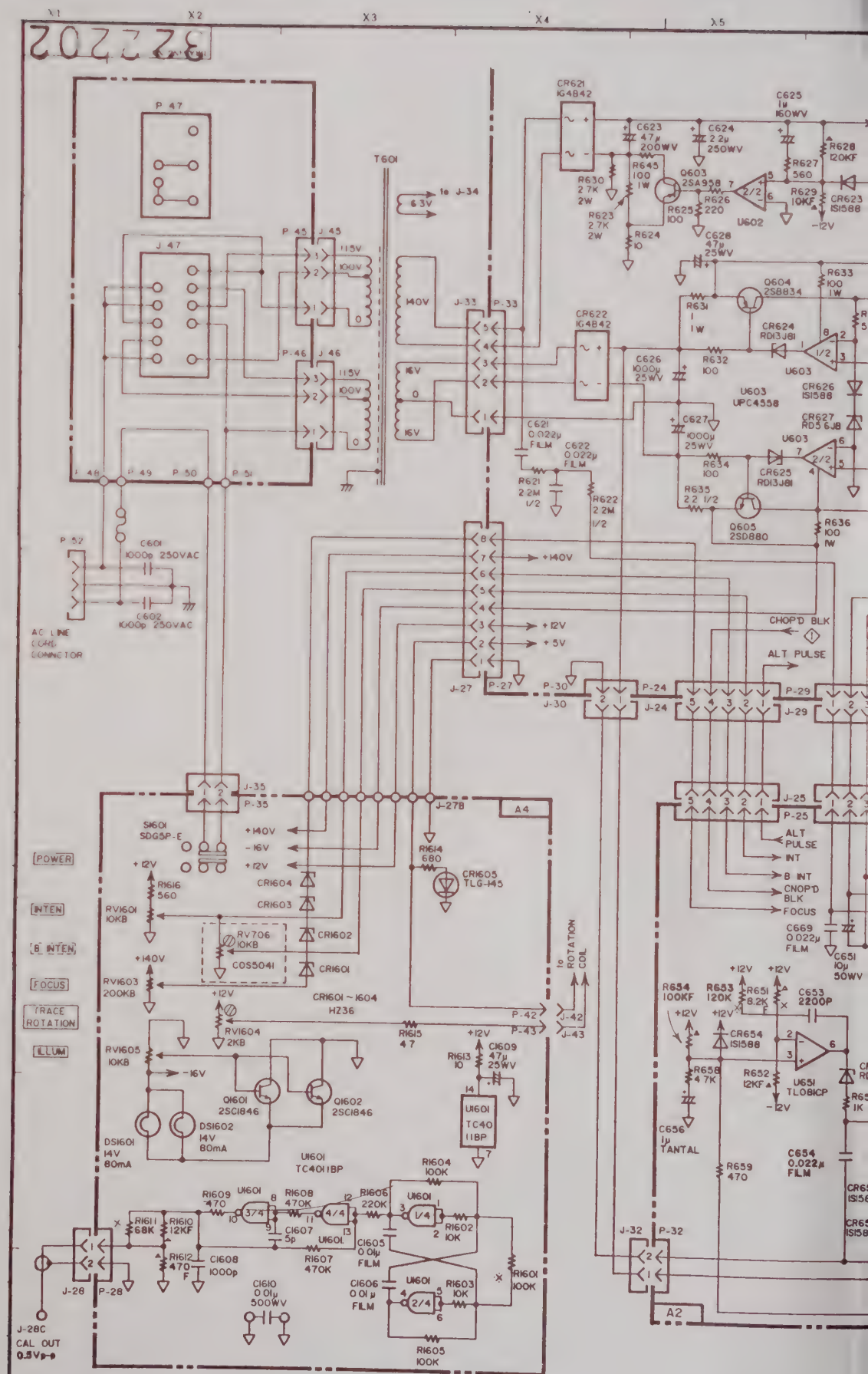
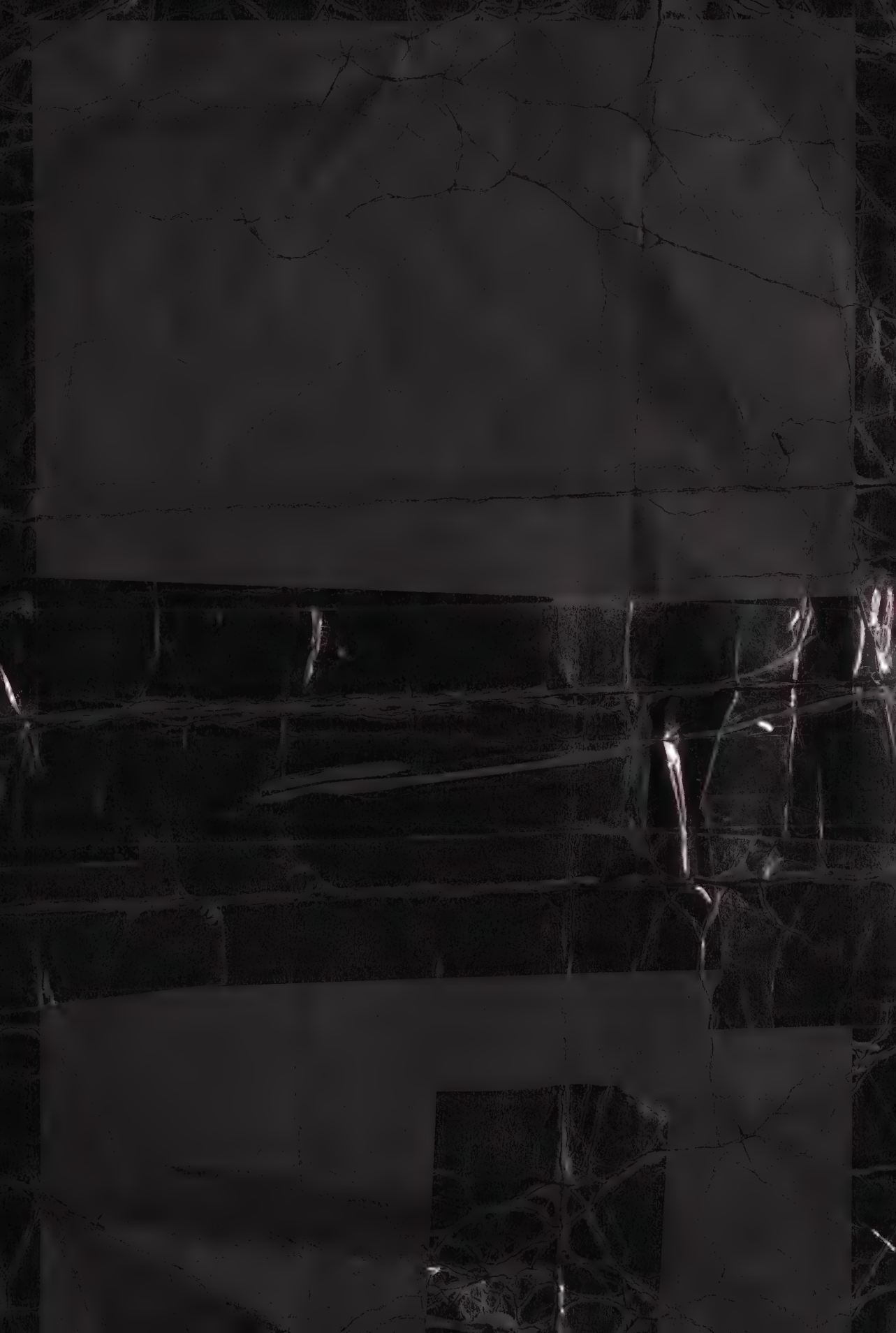

X1
X2
X3
X4
X5
P 47
J 47
T601
to J-34
63V
P 45
J 45
115V
100V
140V
J-33
P-33
16V
0
16V
P-46
J 46
115V
100V
J 48
P 49
P 50
P 51
P 52
C601
1000p 250VAC
C602
1000p 250VAC
AC LINE
CORD
CONNECTOR
CR621
1G4842
C623
47µ
200WV
C624
2.2µ
250WV
C625
1µ
160WV
R628
120KF
R627
560
R630
2.7K
2W
R645
100
1W
Q603
2SA938
R623
2.7K
2W
R625
100
R626
220
U602
R629
10KF
CR623
1S1588
-12V
R624
10
C628
47µ
25WV
R633
100
1W
Q604
2SB834
R631
1
1W
CR624
RD13J8I
U603
R632
100
CR622
1G4842
C626
1000µ
25WV
U603
UPC4558
CR626
1S1588
C627
1000µ
25WV
U603
CR627
RD3.6J8
CR625
RD13J8I
R634
100
R635
2.2 1/2
Q605
2SD880
R636
100
1W
C621
0.022µ
FILM
C622
0.022µ
FILM
R621
2.2M
1/2
R622
2.2M
1/2
+140V
+12V
+5V
CHOP'D BLK
ALT PULSE
J-27
P-27
P-30
J-30
P-24
J-24
P-29
J-29
J-35
P-35
J-278
A4
SW601
SDG5P-E
+140V
-16V
+12V
R1614
680
CR1605
TLG-145
POWER
INTEN
B INTEN
FOCUS
TRACE
ROTATION
ILLUM
+12V
R1616
560
CR1604
CR1603
RV1601
10KB
RV706
10KB
COS5041
CR1602
CR1601
+140V
RV1603
200KB
+12V
CR1601 ~ 1604
HZ36
RV1604
2KB
RV1605
10KB
-16V
Q1601
2SC1846
Q1602
2SC1846
DS1601
14V
80mA
DS1602
14V
80mA
U1601
TC4011BP
R1615
47
P-42
P-43
J-42
J-43
to ROTATION COIL
+12V
R1613
10
C1609
47µ
25WV
U1601
TC40
11BP
J-25
P-25
ALT PULSE
INT
B INT
CHOP'D BLK
FOCUS
C669
0.022µ
FILM
C651
10µ
50WV
+12V
+12V
R654
100KF
R653
120K
R651
8.2K
F
C653
2200P
+12V
+12V
CR654
1S1588
R658
4.7K
R652
12KF
U651
TL081CP
-12V
C656
1µ
TANTAL
R639
470
C654
0.022µ
FILM
J-32
P-32
A2
R1604
100K
R1609
470
U1601
R1608
470K
R1606
220K
U1601
R1602
10K
C1607
5p
U1601
C1605
0.01µ
FILM
R1607
470K
R1611
68K
R1610
12KF
R1612
470
F
C1608
1000p
J-28
P-28
J-28C
CAL OUT
0.5Vp-p
C1610
0.01µ
500WV
C1606
0.01µ
FILM
U1601
R1603
10K
R1601
100K
R1605
100K

Fig. 3.32



KIKUSUI ELECTRONICS CORPORATION

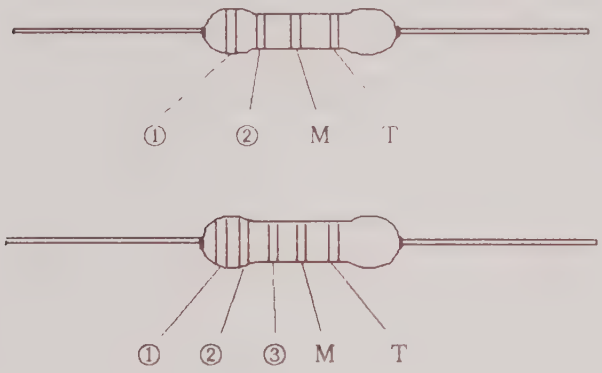
TITLE: COS5041TM ③ CRT CIRCUIT and POWER SUPPLY

CODE NO.

DRAWING NO. 32 2202

3.4-4 Indication, external appearance, and pin allocation of the electronic parts used in oscilloscope

Description of resistance value and its precision



①, ② and ③ --- 1st, and 2nd, and 3rd significant figures

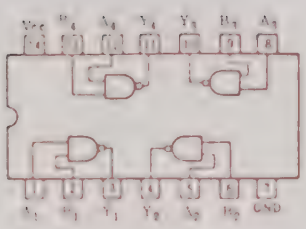
M: multiplier

T: tolerance

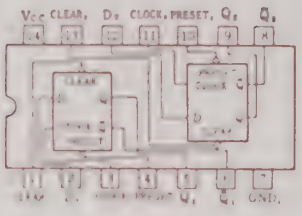
Table 3.12

COLOR	SIGNIFICANT FIGURES	MULTIPLIER	TOLERANCE
BLACK	0	1	---
BROWN	1	10	±1%
RED	2	10^2 or 100	±2%
ORANGE	3	10^3 or 1K	±3%
YELLOW	4	10^4 or 10K	±4%
GREEN	5	10^5 or 100K	±0.5%
BLUE	6	10^6 or 1M	±0.25%
VIOLET	7	---	±0.1%
GRAY	8	---	---
WHITE	9	---	---
GOLD	-	10^{-1} or 0.1	±5%
SILVER	-	10^{-2} or 0.01	±10%
NONE	-	---	±20%

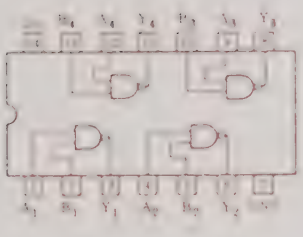
DIGITAL & ANALOG ICs



(TOP VIEW)
TC4011BP

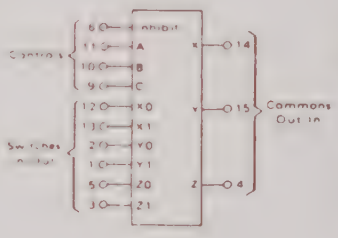


(TOP VIEW)
SN74LS74N



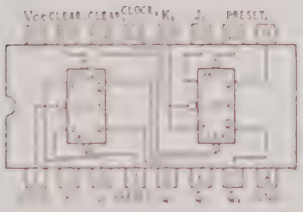
(TOP VIEW)
SN74LS08N

(TOP VIEW)

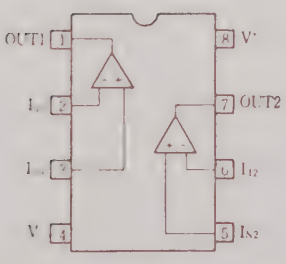


Control Inputs				ON Switches
	Select			
Inhibit	C*	B	A	MC14053B
0	0	0	0	Z0 Y0 X0
0	0	0	1	Z0 Y0 X1
0	0	1	0	Z0 Y1 X0
0	0	1	1	Z0 Y1 X1
0	1	0	0	Z1 Y0 X0
0	1	0	1	Z1 Y0 X1
0	1	1	0	Z1 Y1 X0
0	1	1	1	Z1 Y1 X1
1	x	x	x	None

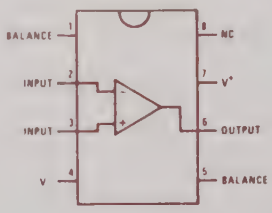
TC4053BP



(TOP VIEW)
SN74LS112N

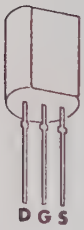


(TOP VIEW)
μPC4558C



(TOP VIEW)
LF13741N
TL081CP

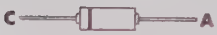
FET



2SK107-3
2SK117-BL

DIODE

GHV-06SSN
ERB26-20



1S1588

1SS83 HZ2B RD5.6JB
1SS86 HZ3C RD13JB
HZ36L

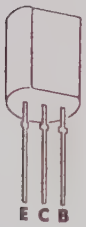
1G4B42

LED

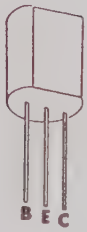
TLG-105

TLR102KW

TRANSISTOR



2SA844-D
2SC1907

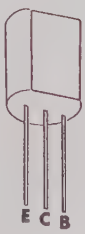


2SC2570

2SA1144-O
2SB648A
2SC1846-R
2SC2371-L
2SC2704-O
2SD668A

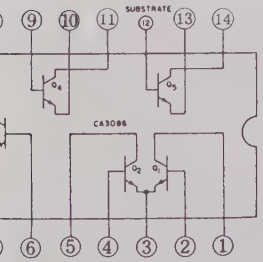
2SA1206-L

2SB834-Y
2SB861-C
2SD880-Y



2SA838-B
2SA1015-Y
2SC945-Q
2SC1843E

TRANSISTOR ARRAY



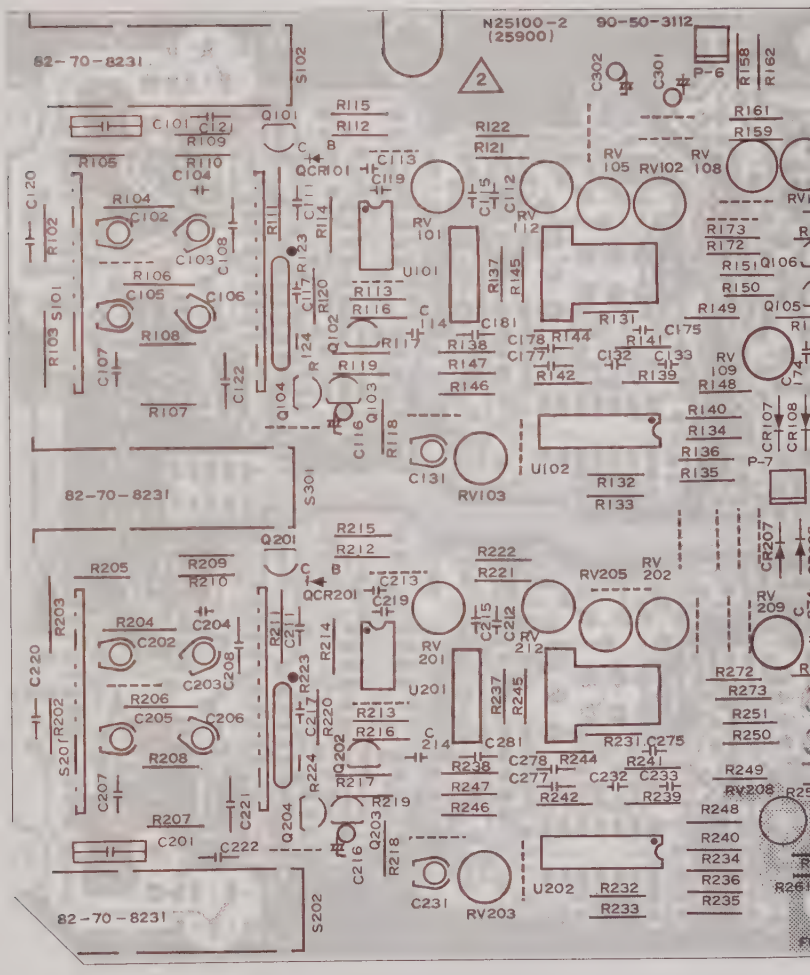
(TOP VIEW)
CA3086

SEMICONDUCTOR LEAD CONFIGURATION

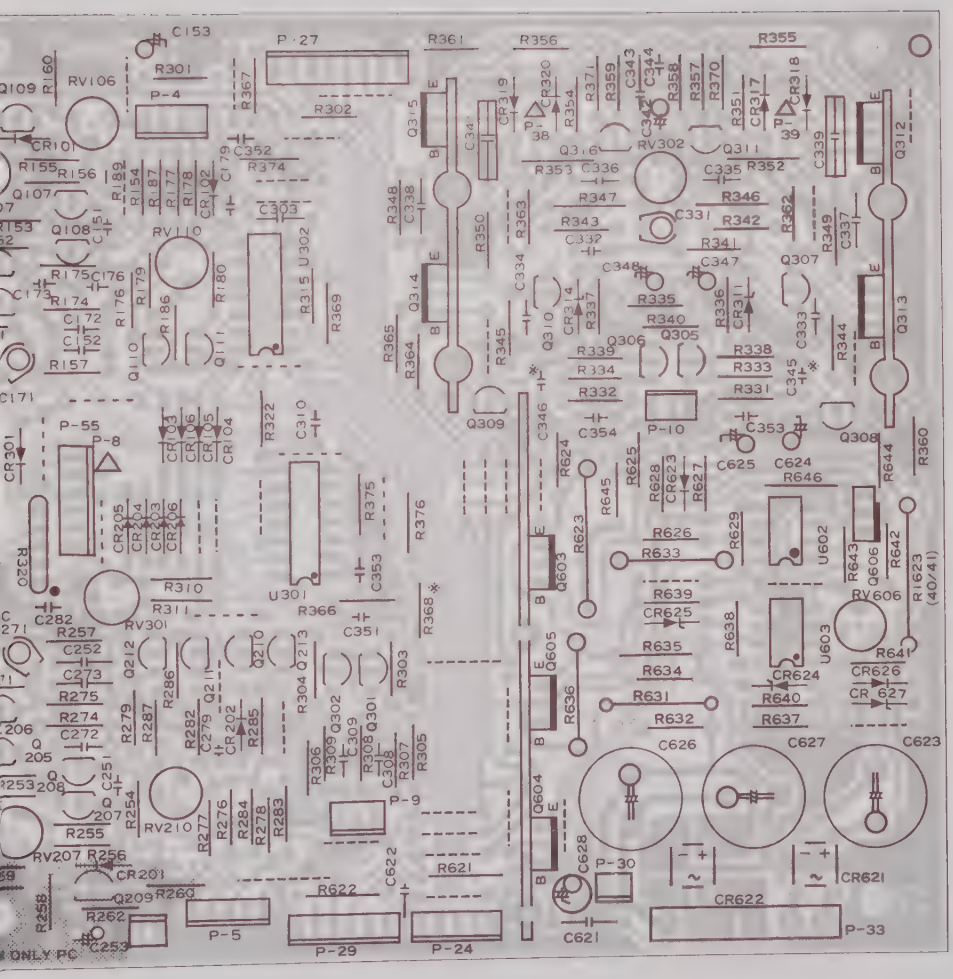
3.4-5 Parts locations

This section describes location of the parts on the boards used in the oscilloscope.

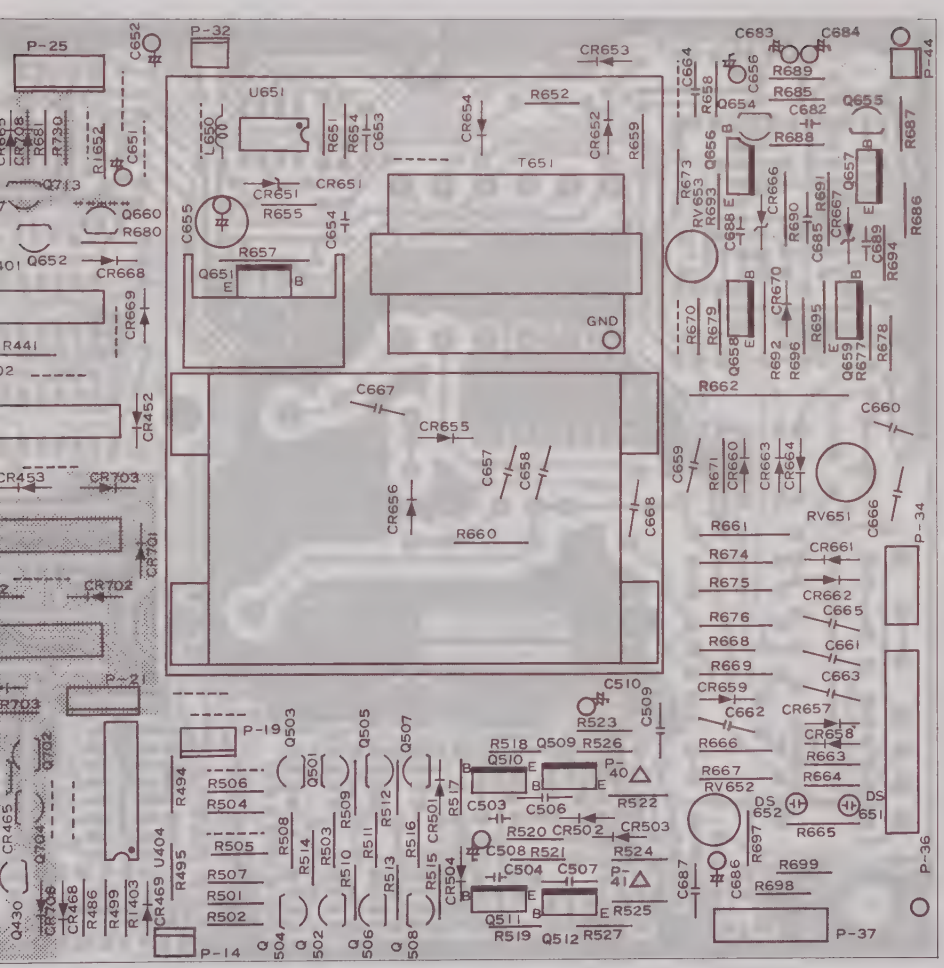
(1) A1 VERT & P. SUPPLY
(2) A2 SWEEP & H. V
(3) A3 SWEEP MODE SWITCH
(4) A4 CAL & CRT CONTROL
(5) A5 VERT MODE SWITCH
(6) A6 CRT CONNECTOR
(7) A7 H. V UNIT



A1 VERT & POWER SUPPLY Parts


P-27
P-4
P-55
P-8
P-10
P-9
P-30
P-5
P-29
P-24
P-33
U301
U602
U603
RV106
RV110
RV301
RV302
RV606
RV207
RV210
CR621
CR622
C626
C627
C623
C621
R621
R622
R623
R624
R625
R626
R627
R628
R629
R630
R631
R632
R633
R634
R635
R636
R637
R638
R639
R640
R641
R642
R643
R644
R645
R646
Q603
Q604
Q605
Q606
Q607
Q608
Q609
Q610
Q611
Q612
Q613
Q614
Q615
Q616
Q617
Q618
Q619
Q620
Q621
Q622
Q623
Q624
Q625
Q626
Q627
Q628
Q629
Q630
Q631
Q632
Q633
Q634
Q635
Q636
Q637
Q638
Q639
Q640
Q641
Q642

90-50-3122 N25103-1 (25903)
82-70-5231
82-70-5242
82-70-5222
P-12 C669
P-11 P-13
P-31
P-15
P-20
P-18
P-16
C409
C402
C403
C404
C408
C410
C431
C451
C452
C455
C456
C457
C459
C460
C461
C465
C468
C701
C703
C707
R407
R401
R402
R406
R405
R427
R428
R408
R409
R410
R415
R417
R418
R416
R419
R420
R429
R425
R422
R421
R423
R424
R471
R472
R431
R432
R436
R435
R442
R469
R468
R470
R477
R475
R466
R462
R461
R455
R498
R487
R438
R440
R456
R458
R488
R725
R713
R489
R459
R484
R496
R720
R721
R714
R715
R718
R719
R711
R712
R722
R723
R724
R463
R485
R482
R481
R479
R480
R464
R708
R709
R683
R684
R681
R454
R478
Q401
Q402
Q403
Q404
Q405
Q407
Q408
Q409
Q410
Q411
Q412
Q413
Q415
Q416
Q417
Q418
Q419
Q421
Q422
Q425
Q426
Q427
Q428
Q429
Q431
Q703
Q705
Q706
Q707
Q708
Q710
Q711
CR401
CR402
CR403
CR454
CR455
CR456
CR457
CR458
CR459
CR460/461
CR462
CR463
CR464
CR704
CR705
CR709
S401
S402
S403
S405
S406
S701
U403
U703
RV401
RV404
RV405
RV406
RV701
RV702
FOR ONLY COS5021/41


P-25
P-32
P-44
P-34
P-36
P-37
P-14
P-19
P-21
U651
T651
GND
C652
C651
C655
C654
C653
C650
C667
C657
C658
C656
C668
C660
C666
C683
C684
C682
C685
C686
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C702
C703
C704
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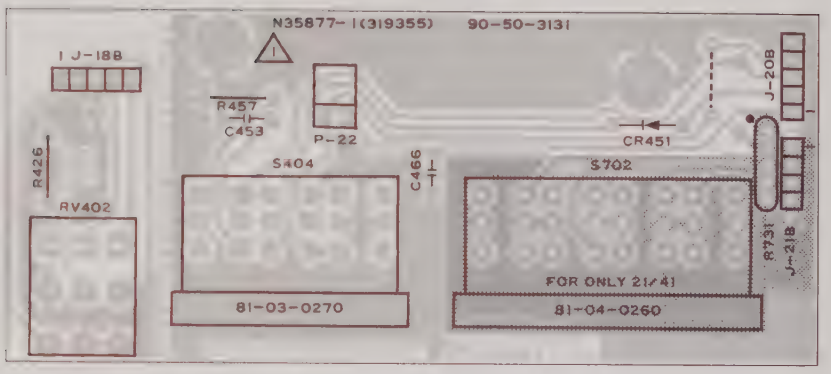
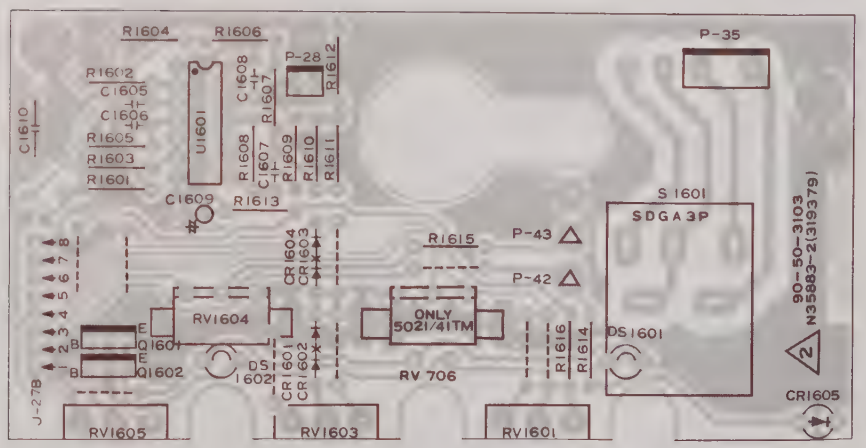
C717
C718
C719
C720
C721
C722
C723
C724



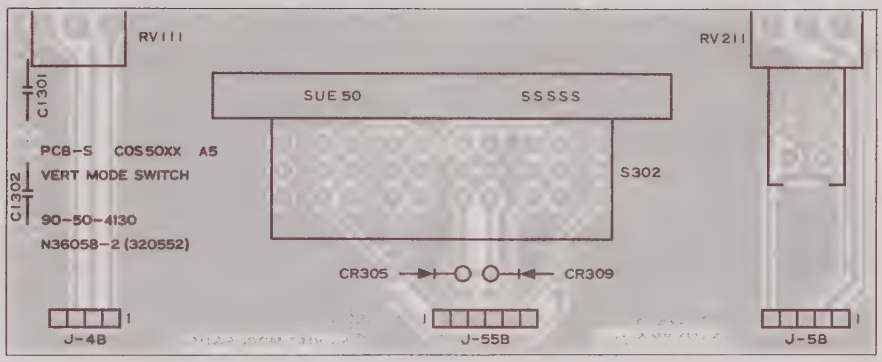
A3 SWEEP MODE SWITCH Parts Location

(Parts side view)



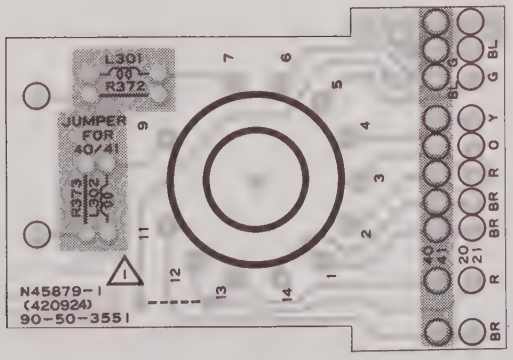
A4 CAL & CRT CONTROL Parts Location

(Parts side view)



A5 VERT MODE SWITCH Parts Location

(Parts side view)



A6 CRT CONNECTOR Parts Location

(Part side view)

3.4-6 Electrical parts list

The parts used in the oscilloscope are listed in units of assemblies.

Table 3.13 lists the assemblies and their contents.

Table 3.13 Assemblies

Assembly Name	Content
A assembly	Parts mounted on A6 board (CRT CONNECTOR)
B assembly	Parts not mounted on PC boards
A1 assembly	Parts mounted on A1 board (VERT & P.SUPPLY)
A2 assembly	Parts mounted on A2 board (SWEEP & H.V) and A7 board (H.V UNIT)
A3 assembly	Parts mounted on A3 board (SWEEP MODE SWITCH)
A4 assembly	Parts mounted on A4 board (CAL & CRT CONTROL)
A5 assembly	Parts mounted on A5 board (VERT MODE SWITCH)

Mnemonic symbols are used for the explanation of parts. Table 3.14 lists the mnemonic symbols.

Table 3.14 Mnemonic Symbols

Mnemonic Symbol	Meaning
CER	CERAMIC
C FILM	CARBON FILM
C COMP	CARBON COMPOSITION
CRT	CATHODE RAY TUBE
ELECT	ELECTROLYTIC
FET	FIELD EFFECT TRANSISTOR
FXD	FIXED
LED	LIGHT EMITTING DIODE
M FILM	METAL FILM
M GLAZE	METAL GLAZE
M OX	METAL OXIDE
M PLSTC FILM	METALLIZED PLASTIC FILM
SI	SILICON
TANT ELECT	TANTALUM ELECTROLYTIC
VAR	VARIABLE
WW	WIRE WOUND
*	OPTIMUM VALUE SELECTED AT FACTORY AVERAGE VALUE SHOWN. (PART MAY BE OMITTED)

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
A ASSEMBLY			
C603	52-96-1140	FXD COMP 0.68PF 10% 500V	
L301	67-10-0880	INDUCTOR 2.2UH 20%	
L302	67-10-0880	INDUCTOR 2.2UH 20%	
R372	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R373	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
RV406	45-01-0761	VAR C COMP 10K OHM B	V16L5G-S
B ASSEMBLY			
C601	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
C602	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
CR409	37-00-0082	LAMP LED RED	TOSHIBA TLR102KW
R101	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R201	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R1402	40-27-0562	FXD C FILM 56 OHM 5% 1/4W	
RV501	45-35-3107	VAR C COMP 10K OHM	V16L4N15KC
S1601	81-01-0270	PUSH SWITCH	ALPS SDG5P-E
T601	60-44-0110	POWER TRANS FOR 5000 SERIES	KIKUSUI S820041
V601	21-16-0602	CATHODE RAY TUBE	TOSHIBA 150BTB31
A1 ASSEMBLY			
C101	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV	
C102	57-10-1191	VAR CER 3-10PF	
C103	57-10-1181	VAR CER 3-6PF	
C104	52-06-2165	FXD CER 33PF 10% 500V TYPE1	
C105	57-10-1191	VAR CER 3-10PF	
C106	57-10-1181	VAR CER 3-6PF	
C107	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C108	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C111	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV	
C112	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C113	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C114	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C115	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C116	54-40-1200	FXD ELECT 10MF 50WV	
C117	52-06-2125	FXD CER 15PF 10% 500V TYPE1	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5020TM
C119	52-06-2102	FXD CER 10P 10% 50V TYPE1
C121	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C122	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C131	57-10-1203	VAR CER 5-20PF
C132	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C133	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C152	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C153	54-40-1200	FXD ELECT 10MF 50WV
C171	57-10-1223	VAR CER 8-50PF
C172	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C173	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C174	52-06-2204	FXD CER 68P 10% 50V TYPE1
C175	52-06-2274	FXD CER 270P 10% 50V TYPE1
C177	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C178	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C179	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C200	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C201	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV
C202	57-10-1191	VAR CER 3-10PF
C203	57-10-1181	VAR CER 3-6PF
C204	52-06-2165	FXD CER 33PF 10% 500V TYPE1
C205	57-10-1191	VAR CER 3-10PF
C206	57-10-1181	VAR CER 3-6PF
C207	52-06-2274	FXD CER 270P 10% 50V TYPE1
C208	52-06-2274	FXD CER 270P 10% 50V TYPE1
C211	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV
C212	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C213	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C214	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C215	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C216	54-40-1200	FXD ELECT 10MF 50WV
C217	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C219	52-06-2102	FXD CER 10P 10% 50V TYPE1
C221	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C222	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C231	57-10-1203	VAR CER 5-20PF
C232	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C233	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C252	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C271	57-10-1223	VAR CER 8-50PF
C272	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C273	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C274	52-06-2204	FXD CER 68P 10% 50V TYPE1
C275	52-06-2274	FXD CER 270P 10% 50V TYPE1
C277	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C278	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C279	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C282	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C301	54-30-1970	FXD ELECT 100MF 25WV
C302	54-30-1970	FXD ELECT 100MF 25WV
C303	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C310	52-01-3365	FXD CER 1500PF 10% 50V TYPE2
C331	57-10-1203	VAR CER 5-20PF
C332	52-06-2051	FXD CER 5P 10% 50V TYPE1

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5020TM		
C333		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C334		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C335		52-96-1140	FXD COMP 0.68PF 10% 500V		
C336		52-96-1140	FXD COMP 0.68PF 10% 500V		
C337		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C338		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C339		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C341		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C342		54-60-1740	FXD ELECT 1MF 160WV		
C343		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2		
C344		50-67-0050	FXD PLSTC FILM 0.047MF 10% 100WV		
C345	*	52-06-2155	FXD CER 27P 10% 50V TYPE1		
C346	*	52-06-2155	FXD CER 27P 10% 50V TYPE1		
C347		54-40-1200	FXD ELECT 10MF 50WV		
C348		54-40-1200	FXD ELECT 10MF 50WV		
C349		52-06-2102	FXD CER 10P 10% 50V TYPE1		
C351		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C352		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C353		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C621		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C622		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C623		54-60-1730	FXD ELECT 47MF 200WV		
C624		54-70-1080	FXD ELECT 2.2MF 250WV		
C625		54-60-1740	FXD ELECT 1MF 160WV		
C626		54-30-1830	FXD ELECT 1000MF 25WV		
C627		54-30-1830	FXD ELECT 1000MF 25WV		
C628		54-30-1960	FXD ELECT 47MF 25WV		
CR101		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR102		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR103		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR104		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR105		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR106		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR107		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR108		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR201		40-27-0000	JUMPER PARTS		
CR202		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR203		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR204		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR205		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR206		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR207		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR208		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR301		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR310		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR311		32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR314		32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR317		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR318		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR319		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR320		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR621		32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR622		32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5020TM		
CR623	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR624	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR625	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR626	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR627	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
Q101	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q102	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q103	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q104	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q105	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q106	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q107	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q108	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q109	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q110	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q111	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q201	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q202	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q203	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q204	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q205	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q206	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q207	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q208	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q210	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q211	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q212	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q213	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q301	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q302	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q305	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q306	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q307	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q308	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q309	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q310	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q311	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q312	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q313	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q314	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q315	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q316	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q603	30-10-9580	TR SI PNP	KIKUSUI	S8309591
Q604	30-20-8341	TR SI PNP	TOSHIBA	2SB834-Y
Q605	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
Q606	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
QCR101	30-31-9071	TR SI NPN	HITACHI	2SC1907
QCR201	30-31-9071	TR SI NPN	HITACHI	2SC1907
R102	40-27-0332	FXD C FILM 33 OHM 5% 1/4W		
R103	42-33-0420	FXD M FILM 1M OHM 1% 1/2W		
R104	42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W		

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R105		42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W	
R106		42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W	
R107		42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R108		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R109		40-27-0682	FXD C FILM 68 OHM 5% 1/4W	
R110		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R111		40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R112		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R113		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R114		40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R115		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R116		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R117		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R118		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R119		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R120		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R121		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R122		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R123		44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R124		38-00-0070	THERMISTOR 200 OHM	
R131		40-27-0000	JUMPER PARTS	
R132		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R133		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R134		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R135		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R136		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R137		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R138		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R139		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R140		40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R141		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R142		42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R144		42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R145		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R146		40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R147		40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R148		42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R149		42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R150		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R151		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R152		40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R153		40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R154		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R155		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R156		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R157		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R158	*	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R159		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R160		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R161		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R162		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R171	*	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R172		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R173		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R174	40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R175	40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R176	40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R177	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R178	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R179	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R180	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R186	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R187	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R189	38-00-0070	THERMISTOR 200 OHM	
R202	40-27-0332	FXD C FILM 33 OHM 5% 1/4W	
R203	42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R204	42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W	
R205	42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W	
R206	42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W	
R207	42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R208	40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R209	40-27-0682	FXD C FILM 68 OHM 5% 1/4W	
R210	40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R211	40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R212	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R213	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R214	40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R215	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R216	40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R217	40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R218	40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R219	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R220	40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R221	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R222	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R223	44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R224	38-00-0070	THERMISTOR 200 OHM	
R231	40-27-0000	JUMPER PARTS	
R232	40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R233	40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R234	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R235	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R236	40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R237	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R238	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R239	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R240	40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R241	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R242	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R244	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R245	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R246	40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R247	40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R248	42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R249	42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R250	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R251	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R252	40-27-1152	FXD C FILM 150 OHM 5% 1/4W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R253		40-27-1152	FXD C FILM 150	OHM 5% 1/4W
R254		40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R255		42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R256		42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R257		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R258		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R271	*	40-27-1102	FXD C FILM 100	OHM 5% 1/4W
R272		40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R273		40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R274		40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R275		40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R276		40-27-1272	FXD C FILM 270	OHM 5% 1/4W
R277		40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R278		40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R279		40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R282		40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R283		40-27-2122	FXD C FILM 1.2K	OHM 5% 1/4W
R284		40-27-2682	FXD C FILM 6.8K	OHM 5% 1/4W
R285		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R286		40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R287		40-27-2222	FXD C FILM 2.2K	OHM 5% 1/4W
R301		40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R302		40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R303		42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R304		42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R305		40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R306		40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R307		40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R308		40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R309		40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R310		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R311		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R315		40-27-2102	FXD C FILM 1K	OHM 5% 1/4W
R320		44-07-0020	FXD M GLAZE RESISTOR NETWORKS	10K OHM X4
R322		40-27-2102	FXD C FILM 1K	OHM 5% 1/4W
R331		42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R332		42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R333		42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R334		42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R335		40-27-2102	FXD C FILM 1K	OHM 5% 1/4W
R336		40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R337		40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R338		40-27-1472	FXD C FILM 470	OHM 5% 1/4W
R339		40-27-1472	FXD C FILM 470	OHM 5% 1/4W
R340		40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R341	*	40-27-3152	FXD C FILM 15K	OHM 5% 1/4W
R342		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R343		40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R344		40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R345		40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R346		44-91-3330	FXD M OXIDE 33K	OHM 5% 1W
R347		44-91-3330	FXD M OXIDE 33K	OHM 5% 1W
R348		40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R349		40-27-8472	FXD C FILM 4.7	OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R350		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R351		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R352		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R353		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R354		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R355		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R356		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R357		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R358		40-27-0822	FXD C FILM	82 OHM 5% 1/4W
R359		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R360		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R361		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R362		40-27-0000	JUMPER PARTS	
R363		40-27-0000	JUMPER PARTS	
R364		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R365		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R366		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R367		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R368	*	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R369		40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R370		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R371		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R374		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R375		40-27-1122	FXD C FILM	120 OHM 5% 1/4W
R376		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R621		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R622		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R623		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R624		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R625		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R626		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R627		40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R628		42-83-4120	FXD M FILM	120K OHM 1% 1/4W
R629		42-83-2910	FXD M FILM	9.1K OHM 1% 1/4W
R630		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R631		44-91-8101	FXD MOR 1	OHM 5% 1W
R632		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R633		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R634		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R635		40-37-8222	FXD C FILM	2.2 OHM 5% 1/2W
R636		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R637		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R638		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R639		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R640		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R641		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R642		42-83-2390	FXD M FILM	3.9K OHM 1% 1/4W
R643		42-83-2910	FXD M FILM	9.1K OHM 1% 1/4W
R644	*	40-27-1152	FXD C FILM	150 OHM 5% 1/4W
R645		40-27-0000	JUMPER PARTS	
R646		40-37-1101	FXD C FILM	100 OHM 5% 1/2W
RV101		48-33-3200	VAR M FILM	20K OHM
RV102		48-33-1100	VAR M FILM	100 OHM

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
RV103	48-33-1500	VAR M FILM 500 OHM	
RV105	48-33-3200	VAR M FILM 20K OHM	
RV106	48-33-1100	VAR M FILM 100 OHM	
RV107	48-33-2100	VAR M FILM 1K OHM	
RV108	48-33-2200	VAR M FILM 2K OHM	
RV109	48-33-1500	VAR M FILM 500 OHM	
RV110	48-33-2100	VAR M FILM 1K OHM	
RV112	48-33-3200	VAR M FILM 20K OHM	
RV201	48-33-3200	VAR M FILM 20K OHM	
RV202	48-33-1100	VAR M FILM 100 OHM	
RV203	48-33-1500	VAR M FILM 500 OHM	
RV205	48-33-3200	VAR M FILM 20K OHM	
RV207	48-33-2100	VAR M FILM 1K OHM	
RV209	48-33-1500	VAR M FILM 500 OHM	
RV210	48-33-2100	VAR M FILM 1K OHM	
RV212	48-33-3200	VAR M FILM 20K OHM	
RV301	48-33-1500	VAR M FILM 500 OHM	
RV302	48-33-2200	VAR M FILM 2K OHM	
RV606	48-33-2100	VAR M FILM 1K OHM	
S101	80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S102	82-70-8231	LEVER SWITCH	ALPS SLR823-1
S201	80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S202	82-70-8231	LEVER SWITCH	ALPS SLR823-1
S301	82-70-8231	LEVER SWITCH	ALPS SLR823-1
U101	34-00-0121	FET OPE-AMP	N.S LF13741N
U102	30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U201	34-00-0121	FET OPE-AMP	N.S LF13741N
U202	30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U301	35-70-0741	DUAL D F-F EDGE TRIGGER	TEXAS INS. HD74LS74P
U302	35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS. SN74LS00N
U602	34-00-0240	DUAL OPE-AMP	NEC UPC4558C
U603	34-00-0240	DUAL OPE-AMP	NEC UPC4558C

A2 ASSEMBLY

C401	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C402	50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV	
C403	52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C404	52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C405 *	52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C406	54-30-1960	FXD ELECT 47MF 25WV	
C407	54-30-1960	FXD ELECT 47MF 25WV	
C408	54-40-1200	FXD ELECT 10MF 50WV	
C409	54-40-1200	FXD ELECT 10MF 50WV	
C410	54-40-1200	FXD ELECT 10MF 50WV	
C431	55-37-2050	FXD TANT ELECT 1UF 35V	
C432	54-40-1200	FXD ELECT 10MF 50WV	
C433	50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV	
C451	52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C452	54-30-1960	FXD ELECT 47MF 25WV	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5020TM		
C454	52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C455	52-06-2184	FXD CER 47PF 10% 50V TYPE1		
C456	54-40-1200	FXD ELECT 10MF 50WV		
C457	54-30-1960	FXD ELECT 47MF 25WV		
C458	52-06-2225	FXD CER 100PF 10% 50V TYPE1		
C459	50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV		
C460	50-65-0540	FXD M PLSTC FILM 1UF 5% 100WV		
C461	54-30-1960	FXD ELECT 47MF 25WV		
C462	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C463	54-40-1200	FXD ELECT 10MF 50WV		
C464	54-40-1200	FXD ELECT 10MF 50WV		
C465	52-06-2125	FXD CER 15PF 10% 500V TYPE1		
C467	52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C468	50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV		
C469	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C503	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C504	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C506	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C507	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C508	54-40-1200	FXD ELECT 10MF 50WV		
C509	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C510	54-40-1200	FXD ELECT 10MF 50WV		
C651	54-40-1200	FXD ELECT 10MF 50WV		
C652	54-40-1200	FXD ELECT 10MF 50WV		
C653	52-01-3365	FXD CER 1500PF 10% 50V TYPE2		
C654	50-67-0060	FXD PLSTC FILM 0.1MF 10% 100WV		
C655	54-40-1210	FXD ELECT 22MF 50WV		
C656	55-37-2050	FXD TANT ELECT 1UF 35V		
C657	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C658	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C659	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C660	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C661	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C662	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C663	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C664	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C665	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C666	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C667	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C668	52-08-5145	FXD CER 22PF 10% 2KV TYPE1		
C669	50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C681	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C682	52-06-2265	FXD CER 220PF 10% 50V TYPE1		
C683	54-40-1200	FXD ELECT 10MF 50WV		
C684	54-40-1200	FXD ELECT 10MF 50WV		
C685	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C687	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C688	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C689	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
CR401	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR402	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR403	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR404	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM	
CR452	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR453	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR454	32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR455	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR456	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR457	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR458	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR459	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR460	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR461	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR462	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR463	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR464	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR465	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR468	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR469	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR501	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR502	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR503	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR504	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR651	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR652	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR653	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR654	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR655	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR656	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR657	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR658	32-90-1820	DIODE VR=2KV FAST RECOVERY	HITACHI	ERB26-20
CR659	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR660	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR661	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR662	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR663	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR664	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR665	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR666	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR667	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR668	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR669	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR670	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR671	32-92-0620	ZENER VZ 56-68V	TOSHIBA	05Z62
DS651	23-70-0100	LAMP NEON		
DS652	23-70-0100	LAMP NEON		
L650	67-10-0890	INDUCTOR 100MH 10%		
Q401	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q402	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q403	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q404	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q405	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q406	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q407	30-10-8441	TR SI PNP	HITACHI	2SA844-D

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM	
Q408	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q409	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q410	31-20-1171	FET	TOSHIBA	2SK117-BL
Q411	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q412	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q413	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q415	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q416	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q417	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q418	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q419	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q420	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q421	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q422	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q423	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q424	30-31-8431	TR SI NPN	NEC	2SC1843-E
Q425	31-20-1171	FET	TOSHIBA	2SK117-BL
Q426	31-20-1171	FET	TOSHIBA	2SK117-BL
Q427	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q428	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q429	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q430	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q431	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q501	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q502	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q503	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q504	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q505	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q506	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q507	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q508	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q509	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q510	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q511	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q512	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q651	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
Q652	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q654	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q655	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q656	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q657	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q658	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q659	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q660	31-20-1171	FET	TOSHIBA	2SK117-BL

R401	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R402	42-83-2100	FXD M FILM	1K	OHM	1%	1/4W
R403	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R404	40-27-2122	FXD C FILM	1.2K	OHM	5%	1/4W
R405	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R406	40-27-2332	FXD C FILM	3.3K	OHM	5%	1/4W
R407	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R408	40-27-3472	FXD C FILM	47K	OHM	5%	1/4W
R409	42-33-0420	FXD M FILM	1M	OHM	1%	1/2W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R410	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R411	40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R412	40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R413	40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R414	40-27-0682	FXD C FILM	68 OHM 5% 1/4W
R415	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R416	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R417	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R418	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R419	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R420	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R421	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R422	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R423	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R424	40-27-3222	FXD C FILM	22K OHM 5% 1/4W
R425	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R427	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R428	40-27-0332	FXD C FILM	33 OHM 5% 1/4W
R429	40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R431	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R432	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R433	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R434	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R435	40-27-1392	FXD C FILM	390 OHM 5% 1/4W
R436	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R437	40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R438	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R440	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R441	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R442	40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R443	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R452	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R453	40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R454	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R455	40-27-2182	FXD C FILM	1.8K OHM 5% 1/4W
R456	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R458	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R459	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R460	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R461	42-72-3210	FXD M FILM	21K OHM 1% 1/4W
R462	42-83-3330	FXD M FILM	33K OHM 1% 1/4W
R463	40-27-2272	FXD C FILM	2.7K OHM 5% 1/4W
R464	40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W
R466	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R467	40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R468	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R469	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R470	40-27-1822	FXD C FILM	820 OHM 5% 1/4W
R471	40-27-3562	FXD C FILM	56K OHM 5% 1/4W
R472	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R473	40-27-2122	FXD C FILM	1.2K OHM 5% 1/4W
R475	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R476	40-27-3182	FXD C FILM	18K OHM 5% 1/4W
R477	40-27-1222	FXD C FILM	220 OHM 5% 1/4W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R478	42-83-2220	FXD M FILM 2.2K OHM 1% 1/4W	
R479	40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R480	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R481	40-27-3332	FXD C FILM 33K OHM 5% 1/4W	
R482	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R483	40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R484	42-83-2160	FXD M FILM 1.6K OHM 1% 1/4W	
R485	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R486	40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R487	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R488	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R489	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R491	42-24-0231	FXD M GLAZE 5M OHM 1% 0.31W	
R492	42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R493	44-04-0010	FXD M GLAZE R-NETWORK	KIKUSUI S8109011
R494	42-83-2390	FXD M FILM 3.9K OHM 1% 1/4W	
R495	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R496	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R498	40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
R499	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R501	40-27-2682	FXD C FILM 6.8K OHM 5% 1/4W	
R502	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R503	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R504	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R505	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R506	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R507	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R508	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R509	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R510	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R511	42-83-2120	FXD M FILM 1.2K OHM 1% 1/4W	
R512	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R513	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R514	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R515	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R516	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R517	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R518	42-83-4100	FXD M FILM 100K OHM 1% 1/4W	
R519	42-83-4100	FXD M FILM 100K OHM 1% 1/4W	
R520	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R521	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R522	40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R523	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R524	40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R525	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R526	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R527	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R651	42-83-2820	FXD M FILM 8.2K OHM 1% 1/4W	
R652	42-83-3120	FXD M FILM 12K OHM 1% 1/4W	
R654	42-83-3680	FXD M FILM 68K OHM 1% 1/4W	
R655	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R656	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R657	44-91-8101	FXD MOR 1 OHM 5% 1W	
R658	40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R659		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R660		40-37-3221	FXD C FILM 22K OHM 5% 1/2W	
R661		40-37-5221	FXD C FILM 2.2M OHM 5% 1/2W	
R662		42-44-0330	FXD THICK FILM 10M OHM 1% 1W	
R663		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R664		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R665		40-37-5221	FXD C FILM 2.2M OHM 5% 1/2W	
R666		40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R667		40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R668		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R669		40-37-5151	FXD C FILM 1.5M OHM 5% 1/2W	
R670		40-27-3822	FXD C FILM 82K OHM 5% 1/4W	
R671		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R673		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R674		40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R675		40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R676		40-37-5151	FXD C FILM 1.5M OHM 5% 1/2W	
R677		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R678		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R679		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R680		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R681		40-27-2182	FXD C FILM 1.8K OHM 5% 1/4W	
R683		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R684		40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R685		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R686		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R687		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R688		40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R689		40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R690		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R691		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R692		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R693		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R694		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R695		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R696		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R698	*	40-27-4222	FXD C FILM 220K OHM 5% 1/4W	
R699		40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R1401		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1403		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1404		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1405		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1652		40-27-3182	FXD C FILM 18K OHM 5% 1/4W	
R1654		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
RV401		48-33-2500	VAR M FILM 5K OHM	
RV404		48-33-4500	VAR M FILM 500K OHM	
RV405		48-33-3100	VAR M FILM 10K OHM	
RV651		48-26-5220	VAR M GLAZE 2.2M OHM	
RV652		48-33-4100	VAR M FILM 100K OHM	
RV653		48-33-3200	VAR M FILM 20K OHM	
S401		82-70-5231	LEVER SWICH	
S402		82-70-5242	LEVER SWITCH	ALPS SLR524-2

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM	
S403		82-70-5222	PUSH SWITCH	ALPS	SLR522-2
S406		80-98-0471	SW ROTARY WITH RV SWEEP/DIV		
T651		63-92-0130	CONVERTOR TRANS	KIKUSUI	S810115
U401		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS.	SN74LS00N
U402		35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.	SN74LS112N
U403		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.	TL081CP
U404		34-69-0030	TRIPLE 2-CHANNEL MULTIPLEXER	TOSHIBA	TC4053BP
U651		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.	TL081CP

A3 ASSEMBLY

C453		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C466		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2		
CR451		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
R426		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W		
R457		40-27-3102	FXD C FILM 10K OHM 5% 1/4W		
RV402		45-01-0550	VAR C COMP 10K/100K OHM B		
S404		81-03-0270	PUSH SWITCH	ALPS	SUE30

A4 ASSEMBLY

C1605		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C1606		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C1607		52-06-2051	FXD CER 5P 10% 50V TYPE1		
C1608		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C1609		54-30-1960	FXD ELECT 47MF 25WV		
C1610		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
CR1601		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1602		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1603		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1604		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1605		37-00-0061	LAMP LED GREEN	TOSHIBA	TLG145
DS1601		23-44-0000	LAMP FILAMENT 14V 80MA		
DS1602		23-44-0000	LAMP FILAMENT 14V 80MA		
Q1601		30-31-8461	TR SI NPN	MATSUSITA	2SC1846-R
Q1602		30-31-8461	TR SI NPN	MATSUSITA	2SC1846-R
R1601	*	40-27-4102	FXD C FILM 100K OHM 5% 1/4W		
R1602		40-27-3102	FXD C FILM 10K OHM 5% 1/4W		
R1603		40-27-3102	FXD C FILM 10K OHM 5% 1/4W		
R1604		40-27-4102	FXD C FILM 100K OHM 5% 1/4W		

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5020TM
R1605		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R1606		40-27-4222	FXD C FILM 220K OHM 5% 1/4W	
R1607		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1608		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1609		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R1610		42-83-3120	FXD M FILM 12K OHM 1% 1/4W	
R1611	*	40-27-3682	FXD C FILM 68K OHM 5% 1/4W	
R1612		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R1613		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R1614		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R1615		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W	
R1616		40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
RV1601		45-44-3101	VAR C COMP 10K OHM	V16L6SN15KC
RV1603		45-44-4201	VAR C COMP 200K OHM	V16L6SN15KC
RV1604		45-43-2200	VAR M GLAZE 2K OHM	
RV1605		45-44-3101	VAR C COMP 10K OHM	V16L6SN15KC
U1601		35-60-0000	QUAD 2-INPUT NAND GATES	TOSHIBA TC4011BP

A5 ASSEMBLY

CR305		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA 1S1588
CR309		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA 1S1588
RV111		45-35-3108	VAR C COMP 10K OHM	V16L4SN15KC
RV211		45-01-0681	VAR C COMP 10K OHM WITH SW	V16L4SN15KC
S302		81-05-0260	PUSH SWITCH	KIKUSUI S8508921

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
A ASSEMBLY			
C603	52-96-1140	FXD COMP 0.68PF 10% 500V	
L301	67-10-0880	INDUCTOR 2.2UH 20%	
L302	67-10-0880	INDUCTOR 2.2UH 20%	
R372	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R373	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
B ASSEMBLY			
C601	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
C602	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
CR409	37-00-0082	LAMP LED RED	TOSHIBA TLR102KW
R101	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R201	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R1402	40-27-0562	FXD C FILM 56 OHM 5% 1/4W	
RV501	45-35-3107	VAR C COMP 10K OHM	V16L4N15KC
S1601	81-01-0270	PUSH SWITCH	ALPS SDG5P-E
T601	60-44-0110	POWER TRANS FOR 5000 SERIES	KIKUSUI S820041
V601	21-16-0602	CATHODE RAY TUBE	TOSHIBA 150BTB31
A1 ASSEMBLY			
C101	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV	
C102	57-10-1191	VAR CER 3-10PF	
C103	57-10-1181	VAR CER 3-6PF	
C104	52-06-2165	FXD CER 33PF 10% 500V TYPE1	
C105	57-10-1191	VAR CER 3-10PF	
C106	57-10-1181	VAR CER 3-6PF	
C107	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C108	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C111	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV	
C112	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C113	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C114	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C115	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C116	54-40-1200	FXD ELECT 10MF 50WV	
C117	52-06-2125	FXD CER 15PF 10% 500V TYPE1	
C119	52-06-2102	FXD CER 10P 10% 50V TYPE1	
C121	52-06-2265	FXD CER 220PF 10% 50V TYPE1	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5021TM
C122	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C131	57-10-1203	VAR CER 5-20PF
C132	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C133	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C152	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C153	54-40-1200	FXD ELECT 10MF 50WV
C171	57-10-1223	VAR CER 8-50PF
C172	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C173	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C174	52-06-2204	FXD CER 68P 10% 50V TYPE1
C175	52-06-2274	FXD CER 270P 10% 50V TYPE1
C177	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C178	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C179	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C200	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C201	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV
C202	57-10-1191	VAR CER 3-10PF
C203	57-10-1181	VAR CER 3-6PF
C204	52-06-2165	FXD CER 33PF 10% 500V TYPE1
C205	57-10-1191	VAR CER 3-10PF
C206	57-10-1181	VAR CER 3-6PF
C207	52-06-2274	FXD CER 270P 10% 50V TYPE1
C208	52-06-2274	FXD CER 270P 10% 50V TYPE1
C211	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV
C212	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C213	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C214	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C215	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C216	54-40-1200	FXD ELECT 10MF 50WV
C217	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C219	52-06-2102	FXD CER 10P 10% 50V TYPE1
C221	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C222	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C231	57-10-1203	VAR CER 5-20PF
C232	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C233	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C252	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C271	57-10-1223	VAR CER 8-50PF
C272	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C273	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C274	52-06-2204	FXD CER 68P 10% 50V TYPE1
C275	52-06-2274	FXD CER 270P 10% 50V TYPE1
C277	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C278	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C279	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C282	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C301	54-30-1970	FXD ELECT 100MF 25WV
C302	54-30-1970	FXD ELECT 100MF 25WV
C303	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C310	52-01-3365	FXD CER 1500PF 10% 50V TYPE2
C331	57-10-1203	VAR CER 5-20PF
C332	52-06-2051	FXD CER 5P 10% 50V TYPE1
C333	50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV
C334	50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5021TM		
C335		52-96-1140	FXD COMP 0.68PF 10% 500V		
C336		52-96-1140	FXD COMP 0.68PF 10% 500V		
C337		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C338		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C339		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C341		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C342		54-60-1740	FXD ELECT 1MF 160WV		
C343		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2		
C344		50-67-0050	FXD PLSTC FILM 0.047MF 10% 100WV		
C345	*	52-06-2155	FXD CER 27P 10% 50V TYPE1		
C346	*	52-06-2155	FXD CER 27P 10% 50V TYPE1		
C347		54-40-1200	FXD ELECT 10MF 50WV		
C348		54-40-1200	FXD ELECT 10MF 50WV		
C349		52-06-2102	FXD CER 10P 10% 50V TYPE1		
C351		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C352		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C353		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C621		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C622		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C623		54-60-1730	FXD ELECT 47MF 200WV		
C624		54-70-1080	FXD ELECT 2.2MF 250WV		
C625		54-60-1740	FXD ELECT 1MF 160WV		
C626		54-30-1830	FXD ELECT 1000MF 25WV		
C627		54-30-1830	FXD ELECT 1000MF 25WV		
C628		54-30-1960	FXD ELECT 47MF 25WV		
CR101		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR102		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR103		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR104		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR105		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR106		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR107		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR108		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR201		40-27-0000	JUMPER PARTS		
CR202		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR203		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR204		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR205		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR206		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR207		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR208		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR301		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR310		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR311		32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR314		32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR317		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR318		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR319		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR320		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR621		32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR622		32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR623		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR624		32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM	
CR625	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR626	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR627	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
Q101	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q102	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q103	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q104	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q105	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q106	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q107	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q108	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q109	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q110	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q111	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q201	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q202	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q203	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q204	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q205	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q206	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q207	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q208	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q210	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q211	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q212	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q213	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q301	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q302	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q305	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q306	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q307	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q308	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q309	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q310	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q311	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q312	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q313	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q314	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q315	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q316	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q603	30-10-9580	TR SI PNP	KIKUSUI	S8309591
Q604	30-20-8341	TR SI PNP	TOSHIBA	2SB834-Y
Q605	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
Q606	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
QCR101	30-31-9071	TR SI NPN	HITACHI	2SC1907
QCR201	30-31-9071	TR SI NPN	HITACHI	2SC1907
R102	40-27-0332	FXD C FILM 33 OHM 5% 1/4W		
R103	42-33-0420	FXD M FILM 1M OHM 1% 1/2W		
R104	42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W		
R105	42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W		
R106	42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W		

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R107		42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R108		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R109		40-27-0682	FXD C FILM 68 OHM 5% 1/4W	
R110		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R111		40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R112		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R113		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R114		40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R115		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R116		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R117		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R118		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R119		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R120		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R121		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R122		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R123		44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R124		38-00-0070	THERMISTOR 200 OHM	
R131		40-27-0000	JUMPER PARTS	
R132		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R133		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R134		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R135		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R136		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R137		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R138		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R139		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R140		40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R141		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R142		42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R144		42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R145		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R146		40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R147		40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R148		42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R149		42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R150		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R151		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R152		40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R153		40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R154		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R155		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R156		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R157		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R158	*	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R159		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R160		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R161		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R162		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R172		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R173		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R174		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R175		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R176		40-27-1272	FXD C FILM 270 OHM 5% 1/4W	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R177	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R178	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R179	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R180	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R186	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R187	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R189	38-00-0070	THERMISTOR 200 OHM	
R202	40-27-0332	FXD C FILM 33 OHM 5% 1/4W	
R203	42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R204	42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W	
R205	42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W	
R206	42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W	
R207	42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R208	40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R209	40-27-0682	FXD C FILM 68 OHM 5% 1/4W	
R210	40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R211	40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R212	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R213	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R214	40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R215	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R216	40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R217	40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R218	40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R219	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R220	40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R221	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R222	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R223	44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R224	38-00-0070	THERMISTOR 200 OHM	
R231	40-27-0000	JUMPER PARTS	
R232	40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R233	40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R234	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R235	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R236	40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R237	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R238	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R239	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R240	40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R241	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R242	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R244	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R245	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R246	40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R247	40-27-0272	FXD C FILM 27 OHM 5% 1/4W	
R248	42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R249	42-83-1680	FXD M FILM 680 OHM 1% 1/4W	
R250	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R251	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R252	40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R253	40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R254	40-27-0822	FXD C FILM 82 OHM 5% 1/4W	
R255	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R256		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R257		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R258		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R272		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R273		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R274		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R275		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R276		40-27-1272	FXD C FILM 270 OHM 5% 1/4W	
R277		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R278		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R279		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R282		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R283		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R284		40-27-2682	FXD C FILM 6.8K OHM 5% 1/4W	
R285		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R286		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R287		40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R301		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R302		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R303		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R304		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R305		40-27-1822	FXD C FILM 820 OHM 5% 1/4W	
R306		40-27-1822	FXD C FILM 820 OHM 5% 1/4W	
R307		40-27-1822	FXD C FILM 820 OHM 5% 1/4W	
R308		40-27-0822	FXD C FILM 82 OHM 5% 1/4W	
R309		40-27-0822	FXD C FILM 82 OHM 5% 1/4W	
R310		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R311		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R315		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R320		44-07-0020	FXD M GLAZE RESISTOR NETWORKS	10K OHM X4
R322		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R331		42-83-0910	FXD M FILM 91 OHM 1% 1/4W	
R332		42-83-0910	FXD M FILM 91 OHM 1% 1/4W	
R333		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R334		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R335		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R336		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R337		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R338		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R339		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R340		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R341	*	40-27-3152	FXD C FILM 15K OHM 5% 1/4W	
R342		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R343		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R344		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R345		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R346		44-91-3330	FXD M OXIDE 33K OHM 5% 1W	
R347		44-91-3330	FXD M OXIDE 33K OHM 5% 1W	
R348		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R349		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W	
R350		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W	
R351		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R352		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R353		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R354		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R355		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R356		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R357		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R358		40-27-0822	FXD C FILM	82 OHM 5% 1/4W
R359		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R360		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R361		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R362		40-27-0000	JUMPER PARTS	
R363		40-27-0000	JUMPER PARTS	
R364		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R365		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R366		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R367		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R368	*	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R369		40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R370		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R371		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R374		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R375		40-27-1122	FXD C FILM	120 OHM 5% 1/4W
R376		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R621		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R622		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R623		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R624		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R625		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R626		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R627		40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R628		42-83-4120	FXD M FILM	120K OHM 1% 1/4W
R629		42-83-2910	FXD M FILM	9.1K OHM 1% 1/4W
R630		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R631		44-91-8101	FXD MOR 1	OHM 5% 1W
R632		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R633		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R634		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R635		40-37-8222	FXD C FILM	2.2 OHM 5% 1/2W
R636		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R637		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R638		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R639		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R640		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R641		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R642		42-83-2390	FXD M FILM	3.9K OHM 1% 1/4W
R643		42-83-2910	FXD M FILM	9.1K OHM 1% 1/4W
R644	*	40-27-1152	FXD C FILM	150 OHM 5% 1/4W
R645		40-27-0000	JUMPER PARTS	
R646		40-37-1101	FXD C FILM	100 OHM 5% 1/2W
RV101		48-33-3200	VAR M FILM	20K OHM
RV102		48-33-1100	VAR M FILM	100 OHM
RV103		48-33-1500	VAR M FILM	500 OHM
RV105		48-33-3200	VAR M FILM	20K OHM
RV106		48-33-1100	VAR M FILM	100 OHM
RV107		48-33-2100	VAR M FILM	1K OHM

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
RV108		48-33-2200	VAR M FILM 2K OHM	
RV109		48-33-1500	VAR M FILM 500 OHM	
RV110		48-33-2100	VAR M FILM 1K OHM	
RV112		48-33-3200	VAR M FILM 20K OHM	
RV201		48-33-3200	VAR M FILM 20K OHM	
RV202		48-33-1100	VAR M FILM 100 OHM	
RV203		48-33-1500	VAR M FILM 500 OHM	
RV205		48-33-3200	VAR M FILM 20K OHM	
RV207		48-33-2100	VAR M FILM 1K OHM	
RV209		48-33-1500	VAR M FILM 500 OHM	
RV210		48-33-2100	VAR M FILM 1K OHM	
RV212		48-33-3200	VAR M FILM 20K OHM	
RV301		48-33-1500	VAR M FILM 500 OHM	
RV302		48-33-2200	VAR M FILM 2K OHM	
RV606		48-33-2100	VAR M FILM 1K OHM	
R171	*	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R271	*	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
S101		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S102		82-70-8231	LEVER SWITCH	ALPS SLR823-1
S201		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S202		82-70-8231	LEVER SWITCH	ALPS SLR823-1
S301		82-70-8231	LEVER SWITCH	ALPS SLR823-1
U101		34-00-0121	FET OPE-AMP	N.S LF13741N
U102		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U201		34-00-0121	FET OPE-AMP	N.S LF13741N
U202		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U301		35-70-0741	DUAL D F-F EDGE TRIGGER	TEXAS INS. HD74LS74P
U302		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS. SN74LS00N
U602		34-00-0240	DUAL OPE-AMP	NEC UPC4558C
U603		34-00-0240	DUAL OPE-AMP	NEC UPC4558C

A2 ASSEMBLY

C401		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C402		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV	
C403		52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C404		52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C405	*	52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C406		54-30-1960	FXD ELECT 47MF 25WV	
C407		54-30-1960	FXD ELECT 47MF 25WV	
C408		54-40-1200	FXD ELECT 10MF 50WV	
C409		54-40-1200	FXD ELECT 10MF 50WV	
C410		54-40-1200	FXD ELECT 10MF 50WV	
C431		55-37-2050	FXD TANT ELECT 1UF 35V	
C432		54-40-1200	FXD ELECT 10MF 50WV	
C433		50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV	
C451		52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C452		54-30-1960	FXD ELECT 47MF 25WV	
C454		52-01-3345	FXD CER 1000PF 10% 500V TYPE2	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5021TM
C455	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C456	54-40-1200	FXD ELECT 10MF 50WV
C457	54-30-1960	FXD ELECT 47MF 25WV
C458	52-06-2225	FXD CER 100PF 10% 50V TYPE1
C459	50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV
C460	50-65-0540	FXD M PLSTC FILM 1UF 5% 100WV
C461	54-30-1960	FXD ELECT 47MF 25WV
C462	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C463	54-40-1200	FXD ELECT 10MF 50WV
C464	54-40-1200	FXD ELECT 10MF 50WV
C465	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C467	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C468	50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV
C469	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C503	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C504	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C506	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C507	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C508	54-40-1200	FXD ELECT 10MF 50WV
C509	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C510	54-40-1200	FXD ELECT 10MF 50WV
C651	54-40-1200	FXD ELECT 10MF 50WV
C652	54-40-1200	FXD ELECT 10MF 50WV
C653	52-01-3365	FXD CER 1500PF 10% 50V TYPE2
C654	50-67-0060	FXD PLSTC FILM 0.1MF 10% 100WV
C655	54-40-1210	FXD ELECT 22MF 50WV
C656	55-37-2050	FXD TANT ELECT 1UF 35V
C657	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C658	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C659	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C660	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C661	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C662	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C663	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C664	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C665	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C666	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C667	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C668	52-08-5145	FXD CER 22PF 10% 2KV TYPE1
C669	50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C681	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C682	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C683	54-40-1200	FXD ELECT 10MF 50WV
C684	54-40-1200	FXD ELECT 10MF 50WV
C685	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C687	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C688	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C689	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C701	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C702	50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV
C703	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C704	54-40-1200	FXD ELECT 10MF 50WV
C705	54-40-1200	FXD ELECT 10MF 50WV
C707	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5021TM		
CR401	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR402	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR403	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR404	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR452	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR453	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR454	32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR455	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR456	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR457	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR458	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR459	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR460	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR461	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR462	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR463	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR464	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR465	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR468	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR469	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR501	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR502	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR503	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR504	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR651	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR652	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR653	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR654	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR655	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR656	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR657	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR658	32-90-1820	DIODE VR=2KV FAST RECOVERY	HITACHI	ERB26-20
CR659	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR660	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR661	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR662	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR663	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR664	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR665	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR666	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR667	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR668	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR669	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR670	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR671	32-92-0620	ZENER VZ 56-68V	TOSHIBA	05Z62
CR701	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR702	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR703	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR704	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR705	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR706	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR707	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR708	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR709	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM	
DS651	23-70-0100	LAMP NEON		
DS652	23-70-0100	LAMP NEON		
L650	67-10-0890	INDUCTOR 100MH 10%		
Q401	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q402	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q403	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q404	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q405	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q406	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q407	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q408	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q409	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q410	31-20-1171	FET	TOSHIBA	2SK117-BL
Q411	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q412	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q413	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q415	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q416	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q417	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q418	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q419	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q420	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q421	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q422	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q423	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q424	30-31-8431	TR SI NPN	NEC	2SC1843-E
Q425	31-20-1171	FET	TOSHIBA	2SK117-BL
Q426	31-20-1171	FET	TOSHIBA	2SK117-BL
Q427	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q428	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q429	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q430	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q431	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q501	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q502	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q503	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q504	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q505	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q506	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q507	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q508	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q509	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q510	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q511	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q512	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q651	30-40-8802	TR SI NPN	TOSHIBA	2SD880-Y
Q652	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q654	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q655	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q656	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q657	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q658	30-32-3710	TR SI NPN	NEC	2SC2371-L

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM	
Q659	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q660	31-20-1171	FET	TOSHIBA	2SK117-BL
Q702	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q703	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q704	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q705	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q706	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q707	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q708	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q709	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q710	31-20-1171	FET	TOSHIBA	2SK117-BL
Q711	30-31-8431	TR SI NPN	NEC	2SC1843-E
Q712	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q713	30-10-8441	TR SI PNP	HITACHI	2SA844-D

R401	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R402	42-83-2100	FXD M FILM	1K	OHM	1%	1/4W
R403	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R404	40-27-2122	FXD C FILM	1.2K	OHM	5%	1/4W
R405	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R406	40-27-2332	FXD C FILM	3.3K	OHM	5%	1/4W
R407	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R408	40-27-3472	FXD C FILM	47K	OHM	5%	1/4W
R409	42-33-0420	FXD M FILM	1M	OHM	1%	1/2W
R410	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R411	40-27-2152	FXD C FILM	1.5K	OHM	5%	1/4W
R412	40-27-1562	FXD C FILM	560	OHM	5%	1/4W
R413	40-27-1562	FXD C FILM	560	OHM	5%	1/4W
R414	40-27-0682	FXD C FILM	68	OHM	5%	1/4W
R415	40-27-2392	FXD C FILM	3.9K	OHM	5%	1/4W
R416	40-27-2392	FXD C FILM	3.9K	OHM	5%	1/4W
R417	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R418	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R419	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R420	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R421	40-27-4102	FXD C FILM	100K	OHM	5%	1/4W
R422	40-27-4102	FXD C FILM	100K	OHM	5%	1/4W
R423	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R424	40-27-3222	FXD C FILM	22K	OHM	5%	1/4W
R425	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R427	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R428	40-27-0332	FXD C FILM	33	OHM	5%	1/4W
R429	40-27-1562	FXD C FILM	560	OHM	5%	1/4W
R431	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R432	40-27-2102	FXD C FILM	1K	OHM	5%	1/4W
R433	40-27-4472	FXD C FILM	470K	OHM	5%	1/4W
R434	40-27-4472	FXD C FILM	470K	OHM	5%	1/4W
R435	40-27-1392	FXD C FILM	390	OHM	5%	1/4W
R436	40-27-1102	FXD C FILM	100	OHM	5%	1/4W
R437	40-27-1272	FXD C FILM	270	OHM	5%	1/4W
R438	40-27-1102	FXD C FILM	100	OHM	5%	1/4W
R440	40-27-2102	FXD C FILM	1K	OHM	5%	1/4W
R441	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R442	40-27-8472	FXD C FILM	4.7	OHM	5%	1/4W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R443	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R452	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R453	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R454	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R455	40-27-2182	FXD C FILM 1.8K OHM 5% 1/4W	
R456	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R458	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R459	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R460	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R461	42-72-3210	FXD M FILM 21K OHM 1% 1/4W	
R462	42-83-3330	FXD M FILM 33K OHM 1% 1/4W	
R463	40-27-2272	FXD C FILM 2.7K OHM 5% 1/4W	
R466	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R467	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R468	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R469	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R470	40-27-1822	FXD C FILM 820 OHM 5% 1/4W	
R471	40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R472	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R473	40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R475	40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R476	40-27-3182	FXD C FILM 18K OHM 5% 1/4W	
R477	40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R478	42-83-2220	FXD M FILM 2.2K OHM 1% 1/4W	
R479	40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R480	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R481	40-27-3332	FXD C FILM 33K OHM 5% 1/4W	
R482	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R483	40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R484	42-83-2160	FXD M FILM 1.6K OHM 1% 1/4W	
R485	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R486	40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R487	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R488	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R489	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R491	42-24-0231	FXD M GLAZE 5M OHM 1% 0.31W	
R492	42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R493	44-04-0010	FXD M GLAZE R-NETWORK	KIKUSUI S8109011
R494	42-83-2390	FXD M FILM 3.9K OHM 1% 1/4W	
R495	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R496	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R498	40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
R499	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R501	40-27-2682	FXD C FILM 6.8K OHM 5% 1/4W	
R502	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R503	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R504	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R505	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R506	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R507	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R508	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R509	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R510	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R511	42-83-2120	FXD M FILM 1.2K OHM 1% 1/4W	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R512	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R513	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R514	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R515	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R516	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R517	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R518	42-83-4100	FXD M FILM	100K OHM 1% 1/4W
R519	42-83-4100	FXD M FILM	100K OHM 1% 1/4W
R520	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R521	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R522	40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R523	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R524	40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R525	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R526	40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R527	40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R651	42-83-2820	FXD M FILM	8.2K OHM 1% 1/4W
R652	42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R654	42-83-3680	FXD M FILM	68K OHM 1% 1/4W
R655	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R656	40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R657	44-91-8101	FXD MOR 1	OHM 5% 1W
R658	40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W
R659	40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R660	40-37-3221	FXD C FILM	22K OHM 5% 1/2W
R661	40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R662	42-44-0330	FXD THICK FILM	10M OHM 1% 1W
R663	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R664	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R665	40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R666	40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R667	40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R668	40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R669	40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R670	40-27-3822	FXD C FILM	82K OHM 5% 1/4W
R671	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R673	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R674	40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R675	40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R676	40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R677	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R678	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R679	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R680	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R681	40-27-2182	FXD C FILM	1.8K OHM 5% 1/4W
R683	40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R684	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R685	40-27-1122	FXD C FILM	120 OHM 5% 1/4W
R686	40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R687	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R688	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R689	40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W
R690	40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R691	40-37-3471	FXD C FILM	47K OHM 5% 1/2W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
R692		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R693		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R694		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R695		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R696		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R698	*	40-27-4222	FXD C FILM 220K OHM 5% 1/4W	
R699		40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R702		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R703		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R704		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R705		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R706		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R707		40-27-3182	FXD C FILM 18K OHM 5% 1/4W	
R708		40-27-3222	FXD C FILM 22K OHM 5% 1/4W	
R709		40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R711		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R712		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R713		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R714		42-83-3330	FXD M FILM 33K OHM 1% 1/4W	
R715		42-72-3210	FXD M FILM 21K OHM 1% 1/4W	
R716		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R717		40-27-3182	FXD C FILM 18K OHM 5% 1/4W	
R718		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R719		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R720		42-83-2150	FXD M FILM 1.5K OHM 1% 1/4W	
R721		42-83-2220	FXD M FILM 2.2K OHM 1% 1/4W	
R722		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R723		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R724		44-25-0001	FXD M GLAZE R-NETWORK	
R725		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R730		40-27-2182	FXD C FILM 1.8K OHM 5% 1/4W	
R1401		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1403		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1404		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1405		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1652		40-27-3152	FXD C FILM 15K OHM 5% 1/4W	
R1654		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
RV401		48-33-2500	VAR M FILM 5K OHM	
RV404		48-33-4500	VAR M FILM 500K OHM	
RV405		48-33-3100	VAR M FILM 10K OHM	
RV651		48-26-5220	VAR M GLAZE 2.2M OHM	
RV652		48-33-4100	VAR M FILM 100K OHM	
RV653		48-33-3200	VAR M FILM 20K OHM	
RV702		48-33-2100	VAR M FILM 1K OHM	
RV703		48-33-2200	VAR M FILM 2K OHM	
S401		82-70-5231	LEVER SWICH	
S402		82-70-5242	LEVER SWITCH	ALPS SLR524-2
S403		82-70-5222	PUSH SWITCH	ALPS SLR522-2
S406		80-98-0610	SW ROTALY WITH RV A SWEEP/DIV	ALPS S21P 2421/RV
S701		80-98-0620	SW ROTALY B SWEEP/DIV	KIKUSUI 3155560
T651		63-92-0130	CONVERTOR TRANS	KIKUSUI S810115

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM
U401		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS.SN74LS00N
U402		35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.SN74LS112N
U403		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
U404		34-69-0030	TRIPLE 2-CHANNEL MULTIPLEXER	TOSHIBA TC4053BP
U651		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
U701		35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.SN74LS112N
U702		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS.SN74LS00N
U703		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
A3 ASSEMBLY				
C453		52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C466		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2	
CR451		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA 1S1588
R426		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R457		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R731		44-07-0020	FXD M GLAZE RESISTOR NETWORKS 10K OHM X4	
RV402		45-01-0550	VAR C COMP 10K/100K OHM B	
S404		81-03-0270	PUSH SWITCH	ALPS SUE30
S702		81-04-0260	PUSH SWITCH	ALPS SUE40
A4 ASSEMBLY				
C1605		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV	
C1606		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV	
C1607		52-06-2051	FXD CER 5P 10% 50V TYPE1	
C1608		52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C1609		54-30-1960	FXD ELECT 47MF 25WV	
C1610		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2	
CR1601		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1602		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1603		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1604		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1605		37-00-0061	LAMP LED GREEN	TOSHIBA TLG145
DS1601		23-44-0000	LAMP FILAMENT 14V 80MA	
DS1602		23-44-0000	LAMP FILAMENT 14V 80MA	
Q1601		30-31-8461	TR SI NPN	MATSUSITA 2SC1846-R
Q1602		30-31-8461	TR SI NPN	MATSUSITA 2SC1846-R
R1601	*	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R1602		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R1603		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R1604		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5021TM	
R1605		40-27-4102	FXD C FILM 100K OHM 5% 1/4W		
R1606		40-27-4222	FXD C FILM 220K OHM 5% 1/4W		
R1607		40-27-4472	FXD C FILM 470K OHM 5% 1/4W		
R1608		40-27-4472	FXD C FILM 470K OHM 5% 1/4W		
R1609		40-27-1472	FXD C FILM 470 OHM 5% 1/4W		
R1610		42-83-3120	FXD M FILM 12K OHM 1% 1/4W		
R1611	*	40-27-3682	FXD C FILM 68K OHM 5% 1/4W		
R1612		42-83-1470	FXD M FILM 470 OHM 1% 1/4W		
R1613		40-27-0102	FXD C FILM 10 OHM 5% 1/4W		
R1614		40-27-1682	FXD C FILM 680 OHM 5% 1/4W		
R1615		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W		
R1616		40-27-1562	FXD C FILM 560 OHM 5% 1/4W		
RV706		45-43-3100	VAR M GLAZE 10K OHM		
RV1601		45-44-3101	VAR C COMP 10K OHM		V16L6SN15KC
RV1603		45-44-4201	VAR C COMP 200K OHM		V16L6SN15KC
RV1604		45-43-2200	VAR M GLAZE 2K OHM		
RV1605		45-44-3101	VAR C COMP 10K OHM		V16L6SN15KC
U1601		35-60-0000	QUAD 2-INPUT NAND GATES	TOSHIBA	TC4011BP

A5 ASSEMBLY

CR305		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR309		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
RV111		45-35-3108	VAR C COMP 10K OHM		V16L4SN15KC
RV211		45-01-0681	VAR C COMP 10K OHM WITH SW		V16L4SN15KC
S302		81-05-0260	PUSH SWITCH	KIKUSUI	S8508921

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
A ASSEMBLY			
C603	52-96-1140	FXD COMP 0.68PF 10% 500V	
L301	67-10-0870	INDUCTOR 1UH	
L302	67-10-0870	INDUCTOR 1UH	
R372	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R373	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
RV406	45-01-0761	VAR C COMP 10K OHM B	V16L5G-S
B ASSEMBLY			
C110	52-06-2225	FXD CER 100PF 10% 50V TYPE1	
C210	52-06-2225	FXD CER 100PF 10% 50V TYPE1	
C601	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
C602	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
CR409	37-00-0082	LAMP LED RED	TOSHIBA TLR102KW
DL301	91-90-0003	DELAY LINE 1.3M Z=186 OHM	
R101	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R201	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R1402	40-27-0562	FXD C FILM 56 OHM 5% 1/4W	
RV501	45-35-3107	VAR C COMP 10K OHM	V16L4N15KC
S1601	81-01-0270	PUSH SWITCH	ALPS SDG5P-E
T601	60-44-0110	POWER TRANS FOR 5000 SERIES	KIKUSUI S820041
V601	21-46-0611	CATHODE RAY TUBE	150CXB31
A1 ASSEMBLY			
C101	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV	
C102	57-10-1191	VAR CER 3-10PF	
C103	57-10-1181	VAR CER 3-6PF	
C104	52-06-2165	FXD CER 33PF 10% 500V TYPE1	
C105	57-10-1191	VAR CER 3-10PF	
C106	57-10-1181	VAR CER 3-6PF	
C107	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C108	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C111	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV	
C112	52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2	
C113	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5040TM
C114	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C115	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C116	54-40-1200	FXD ELECT 10MF 50WV
C117	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C119	52-06-2102	FXD CER 10P 10% 50V TYPE1
C120	52-06-3145	FXD CER 22PF 10% 500V TYPE1
C121	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C122	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C131	57-10-1203	VAR CER 5-20PF
C132	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C133	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C151	52-06-2204	FXD CER 68P 10% 50V TYPE1
C152	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C153	54-40-1200	FXD ELECT 10MF 50WV
C171	57-10-1223	VAR CER 8-50PF
C172	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C173	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C174	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C175	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C176	52-06-2051	FXD CER 5P 10% 50V TYPE1
C177	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C178	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C179	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C181	52-06-2225	FXD CER 100PF 10% 50V TYPE1
C200	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C201	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV
C202	57-10-1191	VAR CER 3-10PF
C203	57-10-1181	VAR CER 3-6PF
C204	52-06-2165	FXD CER 33PF 10% 500V TYPE1
C205	57-10-1191	VAR CER 3-10PF
C206	57-10-1181	VAR CER 3-6PF
C207	52-06-2274	FXD CER 270P 10% 50V TYPE1
C208	52-06-2274	FXD CER 270P 10% 50V TYPE1
C211	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV
C212	52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2
C213	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C214	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C215	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C216	54-40-1200	FXD ELECT 10MF 50WV
C217	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C219	52-06-2102	FXD CER 10P 10% 50V TYPE1
C220	52-06-3145	FXD CER 22PF 10% 500V TYPE1
C221	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C222	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C231	57-10-1203	VAR CER 5-20PF
C232	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C233	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C251	52-06-2204	FXD CER 68P 10% 50V TYPE1
C252	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C271	57-10-1223	VAR CER 8-50PF
C272	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C273	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C274	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C275	52-06-2265	FXD CER 220PF 10% 50V TYPE1

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5040TM		
C277		52-06-2215	FXD CER 82PF 10% 500V TYPE1		
C278		52-06-2215	FXD CER 82PF 10% 500V TYPE1		
C279		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C281		52-06-2225	FXD CER 100PF 10% 50V TYPE1		
C282		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C301		54-30-1970	FXD ELECT 100MF 25WV		
C302		54-30-1970	FXD ELECT 100MF 25WV		
C303		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C308		52-06-2155	FXD CER 27P 10% 50V TYPE1		
C309		52-06-2155	FXD CER 27P 10% 50V TYPE1		
C331		57-10-1203	VAR CER 5-20PF		
C332		52-06-2051	FXD CER 5P 10% 50V TYPE1		
C333		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C334		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C335		52-96-1140	FXD COMP 0.68PF 10% 500V		
C336		52-96-1140	FXD COMP 0.68PF 10% 500V		
C337		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C338		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C339		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C341		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C342		54-60-1740	FXD ELECT 1MF 160WV		
C343		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2		
C344		50-67-0050	FXD PLSTC FILM 0.047MF 10% 100WV		
C345	*	52-06-2125	FXD CER 15PF 10% 500V TYPE1		
C346	*	52-06-2125	FXD CER 15PF 10% 500V TYPE1		
C347		54-40-1200	FXD ELECT 10MF 50WV		
C348		54-40-1200	FXD ELECT 10MF 50WV		
C349		52-06-2102	FXD CER 10P 10% 50V TYPE1		
C351		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C352		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C353		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C354		52-06-2145	FXD CER 22PF 10% 500V TYPE1		
C355		52-06-2145	FXD CER 22PF 10% 500V TYPE1		
C621		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C622		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C623		54-60-1730	FXD ELECT 47MF 200WV		
C624		54-70-1080	FXD ELECT 2.2MF 250WV		
C625		54-60-1740	FXD ELECT 1MF 160WV		
C626		54-30-1830	FXD ELECT 1000MF 25WV		
C627		54-30-1830	FXD ELECT 1000MF 25WV		
C628		54-30-1960	FXD ELECT 47MF 25WV		
CR101		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR102		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR103		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR104		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR105		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR106		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR107		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR108		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR201		40-27-0000	JUMPER PARTS		
CR202		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR203		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR204		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5040TM		
CR205	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR206	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR207	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR208	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR301	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR311	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR314	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR317	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR318	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR319	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR320	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR621	32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR622	32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR623	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR624	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR625	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR626	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR627	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
Q101	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q102	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q103	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q104	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q105	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q106	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q107	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q108	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q109	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q110	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q111	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q201	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q202	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q203	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q204	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q205	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q206	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q207	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q208	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q210	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q211	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q212	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q213	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q301	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q302	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q305	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q306	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q307	30-31-7301	TR SI NPN	NEC	2SC1730-L
Q308	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q309	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q310	30-31-7301	TR SI NPN	NEC	2SC1730-L
Q311	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q312	30-11-1441	TR SI PNP	TOSHIBA	2SA1144-O
Q313	30-32-7041	TR SI NPN	TOSHIBA	2SC2704-O
Q314	30-32-7041	TR SI NPN	TOSHIBA	2SC2704-O

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM		
Q315	30-11-1441	TR SI PNP		TOSHIBA	2SA1144-O
Q316	30-32-7531	TR SI NPN		TOSHIBA	2SC2753
Q603	30-10-9580	TR SI PNP		KIKUSUI	S8309591
Q604	30-20-8341	TR SI PNP		TOSHIBA	2SB834-Y
Q605	30-40-8802	TR SI NPN		TOSHIBA	2SD880-Y
Q606	30-40-8802	TR SI NPN		TOSHIBA	2SD880-Y
QCR101	30-31-9071	TR SI NPN		HITACHI	2SC1907
QCR201	30-31-9071	TR SI NPN		HITACHI	2SC1907
R102	40-27-0332	FXD C FILM	33 OHM 5% 1/4W		
R103	42-33-0420	FXD M FILM	1M OHM 1% 1/2W		
R104	42-33-0390	FXD M FILM	900K OHM 0.5% 1/2W		
R105	42-82-4111	FXD M FILM	111K OHM 0.5% 1/4W		
R106	42-33-0400	FXD M FILM	990K OHM 0.5% 1/2W		
R107	42-82-3101	FXD M FILM	10.1K OHM 0.5% 1/4W		
R108	40-27-0152	FXD C FILM	15 OHM 5% 1/4W		
R109	40-27-0822	FXD C FILM	82 OHM 5% 1/4W		
R110	40-27-0152	FXD C FILM	15 OHM 5% 1/4W		
R111	40-37-4471	FXD C FILM	470K OHM 5% 1/2W		
R112	40-27-2102	FXD C FILM	1K OHM 5% 1/4W		
R113	40-27-2102	FXD C FILM	1K OHM 5% 1/4W		
R114	40-27-1392	FXD C FILM	390 OHM 5% 1/4W		
R115	40-27-1102	FXD C FILM	100 OHM 5% 1/4W		
R116	40-27-1682	FXD C FILM	680 OHM 5% 1/4W		
R117	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W		
R118	40-27-2822	FXD C FILM	8.2K OHM 5% 1/4W		
R119	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R120	40-27-2122	FXD C FILM	1.2K OHM 5% 1/4W		
R121	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R122	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R123	44-04-0000	FXD M GLAZE	R-NETWORK	KIKUSUI	S8109001
R124	38-00-0070	THERMISTOR	200 OHM		
R131	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R132	40-27-1122	FXD C FILM	120 OHM 5% 1/4W		
R133	40-27-1122	FXD C FILM	120 OHM 5% 1/4W		
R134	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R135	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R136	40-27-1682	FXD C FILM	680 OHM 5% 1/4W		
R137	40-27-3472	FXD C FILM	47K OHM 5% 1/4W		
R138	40-27-1102	FXD C FILM	100 OHM 5% 1/4W		
R139	42-83-1470	FXD M FILM	470 OHM 1% 1/4W		
R140	40-27-1272	FXD C FILM	270 OHM 5% 1/4W		
R141	42-83-1470	FXD M FILM	470 OHM 1% 1/4W		
R142	42-83-0560	FXD M FILM	56 OHM 1% 1/4W		
R144	42-83-0560	FXD M FILM	56 OHM 1% 1/4W		
R145	40-27-3472	FXD C FILM	47K OHM 5% 1/4W		
R146	40-27-0272	FXD C FILM	27 OHM 5% 1/4W		
R147	40-27-0272	FXD C FILM	27 OHM 5% 1/4W		
R148	42-83-1680	FXD M FILM	680 OHM 1% 1/4W		
R149	42-83-1680	FXD M FILM	680 OHM 1% 1/4W		
R150	40-27-0222	FXD C FILM	22 OHM 5% 1/4W		
R151	40-27-0222	FXD C FILM	22 OHM 5% 1/4W		
R152	40-27-1152	FXD C FILM	150 OHM 5% 1/4W		

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R153		40-27-1152	FXD C FILM 150 OHM 5% 1/4W	
R154		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R155		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R156		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R157		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R158	*	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R159		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R160		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R161		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R162		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R171		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R172		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R173		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R174		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R175		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R176		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R177		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R178		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R179		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R180		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R186		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R187		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R189		38-00-0070	THERMISTOR 200 OHM	
R202		40-27-0332	FXD C FILM 33 OHM 5% 1/4W	
R203		42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R204		42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W	
R205		42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W	
R206		42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W	
R207		42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R208		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R209		40-27-0822	FXD C FILM 82 OHM 5% 1/4W	
R210		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R211		40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R212		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R213		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R214		40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R215		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R216		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R217		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R218		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R219		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R220		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R221		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R222		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R223		44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R224		38-00-0070	THERMISTOR 200 OHM	
R231		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R232		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R233		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R234		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R235		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R236		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R237		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R238		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R239	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R240	40-27-1272	FXD C FILM 270	OHM 5% 1/4W
R241	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R242	42-83-0560	FXD M FILM 56	OHM 1% 1/4W
R244	42-83-0560	FXD M FILM 56	OHM 1% 1/4W
R245	40-27-3472	FXD C FILM 47K	OHM 5% 1/4W
R246	40-27-0272	FXD C FILM 27	OHM 5% 1/4W
R247	40-27-0272	FXD C FILM 27	OHM 5% 1/4W
R248	42-83-1680	FXD M FILM 680	OHM 1% 1/4W
R249	42-83-1680	FXD M FILM 680	OHM 1% 1/4W
R250	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R251	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R252	40-27-1152	FXD C FILM 150	OHM 5% 1/4W
R253	40-27-1152	FXD C FILM 150	OHM 5% 1/4W
R254	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R255	42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R256	42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R257	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R258	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R271	40-27-1122	FXD C FILM 120	OHM 5% 1/4W
R272	40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R273	40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R274	40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R275	40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R276	40-27-1102	FXD C FILM 100	OHM 5% 1/4W
R277	40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R278	40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R279	40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R282	40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R283	40-27-2122	FXD C FILM 1.2K	OHM 5% 1/4W
R284	40-27-2682	FXD C FILM 6.8K	OHM 5% 1/4W
R285	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R286	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R287	40-27-2222	FXD C FILM 2.2K	OHM 5% 1/4W
R301	40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R302	40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R303	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R304	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R305	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R306	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R307	40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R308	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R309	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R310	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R311	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R315	40-27-2102	FXD C FILM 1K	OHM 5% 1/4W
R320	44-07-0020	FXD M GLAZE RESISTOR NETWORKS	10K OHM X4
R322	40-27-0000	JUMPER PARTS	
R331	42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R332	42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R333	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R334	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R335	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R336	40-27-1682	FXD C FILM 680	OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R337		40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R338		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R339		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R341	*	40-27-3332	FXD C FILM	33K OHM 5% 1/4W
R342		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R343		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R344		40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R345		40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R346		44-91-3330	FXD M OXIDE	33K OHM 5% 1W
R347		44-91-3330	FXD M OXIDE	33K OHM 5% 1W
R348		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R349		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R350		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R351		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R352		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R353		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R354		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R355		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R356		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R357		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R358		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R359		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R360		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R361		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R362		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R363		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R364		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R365		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R366		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R367		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R368	*	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R369		40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R370		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R371		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R374		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R375		40-27-1122	FXD C FILM	120 OHM 5% 1/4W
R376		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R621		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R622		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R623		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R624		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R625		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R626		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R627		40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R628		42-83-4120	FXD M FILM	120K OHM 1% 1/4W
R629		42-83-3100	FXD M FILM	10K OHM 1% 1/4W
R630		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R631		44-91-8101	FXD MOR 1	OHM 5% 1W
R632		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R633		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R634		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R635		40-37-8222	FXD C FILM	2.2 OHM 5% 1/2W
R636		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R637		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R638		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R639		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R640		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R641		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R642		42-83-2390	FXD M FILM	3.9K OHM 1% 1/4W
R643		42-83-2910	FXD M FILM	9.1K OHM 1% 1/4W
R644	*	40-27-1152	FXD C FILM	150 OHM 5% 1/4W
R645		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R646		40-37-1101	FXD C FILM	100 OHM 5% 1/2W
RV101		48-33-3200	VAR M FILM	20K OHM
RV102		48-33-1100	VAR M FILM	100 OHM
RV103		48-33-1500	VAR M FILM	500 OHM
RV105		48-33-3200	VAR M FILM	20K OHM
RV106		48-33-1100	VAR M FILM	100 OHM
RV107		48-33-2100	VAR M FILM	1K OHM
RV108		48-33-2200	VAR M FILM	2K OHM
RV109		48-33-1200	VAR M FILM	200 OHM
RV110		48-33-2100	VAR M FILM	1K OHM
RV112		48-33-3200	VAR M FILM	20K OHM
RV201		48-33-3200	VAR M FILM	20K OHM
RV202		48-33-1100	VAR M FILM	100 OHM
RV203		48-33-1500	VAR M FILM	500 OHM
RV205		48-33-3200	VAR M FILM	20K OHM
RV207		48-33-2100	VAR M FILM	1K OHM
RV209		48-33-1200	VAR M FILM	200 OHM
RV210		48-33-2100	VAR M FILM	1K OHM
RV212		48-33-3200	VAR M FILM	20K OHM
RV301		48-33-1500	VAR M FILM	500 OHM
RV302		48-33-2200	VAR M FILM	2K OHM
RV606		48-33-2100	VAR M FILM	1K OHM
S101		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S102		82-70-8231	LEVER SWITCH	ALPS SLR823-1
S201		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS S21P2YC
S202		82-70-8231	LEVER SWITCH	ALPS SLR823-1
S301		82-70-8231	LEVER SWITCH	ALPS SLR823-1
U101		34-00-0121	FET OPE-AMP	N.S LF13741N
U102		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U201		34-00-0121	FET OPE-AMP	N.S LF13741N
U202		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA CA3086
U301		35-70-0741	DUAL D F-F EDGE TRIGGER	TEXAS INS. HD74LS74P
U302		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS. SN74LS00N
U602		34-00-0240	DUAL OPE-AMP	NEC UPC4558C
U603		34-00-0240	DUAL OPE-AMP	NEC UPC4558C

A2 ASSEMBLY

C401		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C402		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C403		52-06-2184	FXD CER 47PF 10% 50V TYPE1

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5040TM
C404		52-06-2184	FXD CER 47PF 10% 50V TYPE1
C405	*	52-01-3305	FXD CER 470PF 10% 500V TYPE2
C406		54-30-1960	FXD ELECT 47MF 25WV
C407		54-30-1960	FXD ELECT 47MF 25WV
C408		54-40-1200	FXD ELECT 10MF 50WV
C409		54-40-1200	FXD ELECT 10MF 50WV
C410		54-40-1200	FXD ELECT 10MF 50WV
C411	*	52-06-2225	FXD CER 100PF 10% 50V TYPE1
C431		55-37-2050	FXD TANT ELECT 1UF 35V
C432		54-40-1200	FXD ELECT 10MF 50WV
C433		50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV
C435		52-06-2155	FXD CER 27P 10% 50V TYPE1
C451		52-06-2184	FXD CER 47PF 10% 50V TYPE1
C452		54-40-1200	FXD ELECT 10MF 50WV
C454		52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C455		52-06-2184	FXD CER 47PF 10% 50V TYPE1
C456		54-40-1200	FXD ELECT 10MF 50WV
C457		54-30-1960	FXD ELECT 47MF 25WV
C458		52-06-2225	FXD CER 100PF 10% 50V TYPE1
C459		50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV
C460		50-65-0540	FXD M PLSTC FILM 1UF 5% 100WV
C461		54-30-1960	FXD ELECT 47MF 25WV
C462		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C463		54-40-1200	FXD ELECT 10MF 50WV
C464		54-40-1200	FXD ELECT 10MF 50WV
C465		52-06-2125	FXD CER 15PF 10% 500V TYPE1
C467		52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C468		50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV
C469		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C503		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C504		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C506		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C507		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C508		54-40-1200	FXD ELECT 10MF 50WV
C509		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C510		54-40-1200	FXD ELECT 10MF 50WV
C651		54-40-1200	FXD ELECT 10MF 50WV
C652		54-40-1200	FXD ELECT 10MF 50WV
C653		52-01-3385	FXD CER 2220PF 10% 500V TYPE2
C654		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C655		54-40-1210	FXD ELECT 22MF 50WV
C656		55-37-2050	FXD TANT ELECT 1UF 35V
C659		52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C660		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C661		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C662		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C663		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C664		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C665		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C666		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C668		52-08-5145	FXD CER 22PF 10% 2KV TYPE1
C669		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C671		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C672		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5040TM		
C673	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C674	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C675	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C676	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C677	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C678	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C679	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C681	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C682	52-06-2265	FXD CER 220PF 10% 50V TYPE1		
C683	54-40-1200	FXD ELECT 10MF 50WV		
C684	54-40-1200	FXD ELECT 10MF 50WV		
C685	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C686	54-40-1200	FXD ELECT 10MF 50WV		
C687	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C688	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C689	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
CR401	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR402	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR403	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR404	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR452	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR453	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR454	32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR455	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR456	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR457	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR458	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR459	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR460	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR461	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR462	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR463	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR464	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR465	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR468	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR469	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR501	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR502	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR503	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR504	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR651	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR652	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR653	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR654	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR657	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR658	32-90-1820	DIODE VR=2KV FAST RECOVERY	HITACHI	ERB26-20
CR659	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR660	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR661	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR662	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR663	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR664	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR665	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5040TM		
CR666	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR667	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR668	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR669	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR670	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR681	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR682	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR683	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR684	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR685	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR686	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR687	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
DS651	23-70-0100	LAMP NEON		
DS652	23-70-0100	LAMP NEON		
L650	67-10-0890	INDUCTOR 100MH 10%		
Q401	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q402	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q403	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q404	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q405	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q406	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q407	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q408	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q409	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q410	31-20-1171	FET	TOSHIBA	2SK117-BL
Q411	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q412	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q413	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q415	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q416	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q417	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q418	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q419	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q420	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q421	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q422	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q423	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q424	30-31-8431	TR SI NPN	NEC	2SC1843-E
Q425	31-20-1171	FET	TOSHIBA	2SK117-BL
Q426	31-20-1171	FET	TOSHIBA	2SK117-BL
Q427	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q428	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q429	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q430	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q431	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q501	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q502	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q503	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q504	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q505	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q506	30-31-9071	TR SI NPN	HITACHI	2SC1907

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM	
Q507	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q508	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q509	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q510	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q511	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q512	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q651	30-40-8804	TR SI NPN	TOSHIBA	2SD880-O
Q652	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q654	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q655	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q656	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q657	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q658	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q659	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q660	31-20-1171	FET	TOSHIBA	2SK117-BL

R401	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R402	42-83-2100	FXD M FILM	1K	OHM	1%	1/4W
R403	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R404	40-27-2122	FXD C FILM	1.2K	OHM	5%	1/4W
R405	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R406	40-27-2332	FXD C FILM	3.3K	OHM	5%	1/4W
R407	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R408	40-27-3472	FXD C FILM	47K	OHM	5%	1/4W
R409	42-33-0420	FXD M FILM	1M	OHM	1%	1/2W
R410	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R411	40-27-2152	FXD C FILM	1.5K	OHM	5%	1/4W
R412	40-27-1272	FXD C FILM	270	OHM	5%	1/4W
R413	40-27-1562	FXD C FILM	560	OHM	5%	1/4W
R414	40-27-0682	FXD C FILM	68	OHM	5%	1/4W
R415	40-27-2392	FXD C FILM	3.9K	OHM	5%	1/4W
R416	40-27-2392	FXD C FILM	3.9K	OHM	5%	1/4W
R417	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R418	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R419	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R420	40-27-1682	FXD C FILM	680	OHM	5%	1/4W
R421	40-27-4102	FXD C FILM	100K	OHM	5%	1/4W
R422	40-27-4102	FXD C FILM	100K	OHM	5%	1/4W
R423	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R424	40-27-3222	FXD C FILM	22K	OHM	5%	1/4W
R425	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R427	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R428	40-27-0332	FXD C FILM	33	OHM	5%	1/4W
R429	40-27-1562	FXD C FILM	560	OHM	5%	1/4W
R431	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R432	40-27-2102	FXD C FILM	1K	OHM	5%	1/4W
R433	40-27-4472	FXD C FILM	470K	OHM	5%	1/4W
R434	40-27-4472	FXD C FILM	470K	OHM	5%	1/4W
R435	40-27-1392	FXD C FILM	390	OHM	5%	1/4W
R436	40-27-1102	FXD C FILM	100	OHM	5%	1/4W
R437	40-27-1272	FXD C FILM	270	OHM	5%	1/4W
R438	40-27-1222	FXD C FILM	220	OHM	5%	1/4W
R440	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R441	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R442	40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W	
R443	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R444	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R452	40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R453	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R454	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R455	40-27-2182	FXD C FILM 1.8K OHM 5% 1/4W	
R456	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R458	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R459	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R460	40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R461	42-72-3210	FXD M FILM 21K OHM 1% 1/4W	
R462	42-83-3330	FXD M FILM 33K OHM 1% 1/4W	
R463	40-27-2272	FXD C FILM 2.7K OHM 5% 1/4W	
R464	40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R466	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R467	40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R468	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R469	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R470	40-27-1822	FXD C FILM 820 OHM 5% 1/4W	
R471	40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R472	40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R473	40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R475	40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R476	40-27-3182	FXD C FILM 18K OHM 5% 1/4W	
R477	40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R478	42-83-2220	FXD M FILM 2.2K OHM 1% 1/4W	
R479	40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R480	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R481	40-27-3332	FXD C FILM 33K OHM 5% 1/4W	
R482	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R483	40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R484	42-83-2160	FXD M FILM 1.6K OHM 1% 1/4W	
R485	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R486	40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R487	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R488	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R489	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R491	42-24-0231	FXD M GLAZE 5M OHM 1% 0.31W	
R492	42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R493	44-04-0010	FXD M GLAZE R-NETWORK	KIKUSUI S8109011
R494	42-83-2390	FXD M FILM 3.9K OHM 1% 1/4W	
R495	42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R496	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R498	40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
R499	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R501	40-27-2682	FXD C FILM 6.8K OHM 5% 1/4W	
R502	40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R503	42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R504	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R505	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R506	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R507	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R508	42-83-2100	FXD M FILM 1K OHM 1% 1/4W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R509		42-83-2100	FXD M FILM	1K OHM 1% 1/4W
R510		42-83-2100	FXD M FILM	1K OHM 1% 1/4W
R511		42-83-1560	FXD M FILM	560 OHM 1% 1/4W
R512		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R513		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R514		40-27-3122	FXD C FILM	12K OHM 5% 1/4W
R515		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R516		40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R517		40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R518		42-83-4100	FXD M FILM	100K OHM 1% 1/4W
R519		42-83-4100	FXD M FILM	100K OHM 1% 1/4W
R520		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R521		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R522		40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R523		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R524		40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R525		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R526		40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R527		40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R651		42-83-2820	FXD M FILM	8.2K OHM 1% 1/4W
R652		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R653	*	40-27-4122	FXD C FILM	120K OHM 5% 1/4W
R654		42-83-4100	FXD M FILM	100K OHM 1% 1/4W
R655		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R657		44-91-8101	FXD MOR 1	OHM 5% 1W
R658		40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W
R659		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R661		42-44-0310	FXD M GLAZE	6.8M OHM 1% 1.6W
R662		42-44-0330	FXD THICK FILM	10M OHM 1% 1W
R663		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R664		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R665		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R666		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R667		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R668		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R669		40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R670		40-27-3272	FXD C FILM	27K OHM 5% 1/4W
R671		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R673		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R674		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R675		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R676		40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R677		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R678		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R679		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R680		40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R681		40-27-2182	FXD C FILM	1.8K OHM 5% 1/4W
R683		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R684		40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R685		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R686		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R687		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R688		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R689		40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
R690		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R691		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R692		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R693		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R694		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R695		40-37-3471	FXD C FILM 47K OHM 5% 1/2W	
R696		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R697		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R698	*	40-27-3392	FXD C FILM 39K OHM 5% 1/4W	
R699		40-27-3562	FXD C FILM 56K OHM 5% 1/4W	
R1401		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1403		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1404		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1405		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1652		40-27-3152	FXD C FILM 15K OHM 5% 1/4W	
R1654		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R1661		40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R1662		40-37-3221	FXD C FILM 22K OHM 5% 1/2W	
RV401		48-33-2500	VAR M FILM 5K OHM	
RV404		48-33-4500	VAR M FILM 500K OHM	
RV405		48-33-3100	VAR M FILM 10K OHM	
RV651		48-26-5220	VAR M GLAZE 2.2M OHM	
RV652		48-33-4100	VAR M FILM 100K OHM	
RV653		48-33-3200	VAR M FILM 20K OHM	
S401		82-70-5231	LEVER SWICH	
S402		82-70-5242	LEVER SWITCH	ALPS SLR524-2
S403		82-70-5222	PUSH SWITCH	ALPS SLR522-2
S406		80-98-0471	SW ROTARY WITH RV SWEEP/DIV	
T651		63-92-0130	CONVERTOR TRANS	KIKUSUI S810115
U401		35-70-0003	QUAD 2-INPUT POSI-NAND	FAIRCHILD 74F00PC
U402		35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.SN74LS112N
U403		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
U404		34-69-0030	TRIPLE 2-CHANNEL MULTIPLEXER	TOSHIBA TC4053BP
U651		34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP

A3 ASSEMBLY

C453		52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C466		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2	
CR451		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA 1S1588
R426		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R457		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
RV402		45-01-0550	VAR C COMP 10K/100K OHM B	
S404		81-03-0270	PUSH SWITCH	ALPS SUE30

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM
A4 ASSEMBLY				
C1605		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV	
C1606		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV	
C1607		52-06-2051	FXD CER 5P 10% 50V TYPE1	
C1608		52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C1609		54-30-1960	FXD ELECT 47MF 25WV	
C1610		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2	
CR1601		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1602		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1603		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1604		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI HZ36L-2
CR1605		37-00-0061	LAMP LED GREEN	TOSHIBA TLG145
DS1601		23-44-0000	LAMP FILAMENT 14V 80MA	
DS1602		23-44-0000	LAMP FILAMENT 14V 80MA	
Q1601		30-31-8461	TR SI NPN	MATSUSITA 2SC1846-R
Q1602		30-31-8461	TR SI NPN	MATSUSITA 2SC1846-R
R1601	*	40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R1602		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R1603		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R1604		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R1605		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R1606		40-27-4222	FXD C FILM 220K OHM 5% 1/4W	
R1607		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1608		40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1609		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R1610		42-83-3120	FXD M FILM 12K OHM 1% 1/4W	
R1611	*	40-27-3682	FXD C FILM 68K OHM 5% 1/4W	
R1612		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R1613		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R1614		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R1615		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W	
R1616		40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
RV1601		45-44-3101	VAR C COMP 10K OHM	V16L6SN15KC
RV1603		45-44-4201	VAR C COMP 200K OHM	V16L6SN15KC
RV1604		45-43-2200	VAR M GLAZE 2K OHM	
RV1605		45-44-3101	VAR C COMP 10K OHM	V16L6SN15KC
U1601		35-60-0000	QUAD 2-INPUT NAND GATES	TOSHIBA TC4011BP
A5 ASSEMBLY				
C1301		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2	
C1302		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5040TM	
CR305	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR309	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
RV111	45-35-3108	VAR C COMP 10K OHM		V16L4SN15KC
RV211	45-01-0681	VAR C COMP 10K OHM WITH SW		V16L4SN15KC
S302	81-05-0260	PUSH SWITCH	KIKUSUI	S8508921

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
A ASSEMBLY			
C603	52-96-1140	FXD COMP 0.68PF 10% 500V	
L301	67-10-0870	INDUCTOR 1UH	
L302	67-10-0870	INDUCTOR 1UH	
R372	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R373	40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
B ASSEMBLY			
C110	52-06-2225	FXD CER 100PF 10% 50V TYPE1	
C210	52-06-2225	FXD CER 100PF 10% 50V TYPE1	
C601	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
C602	52-77-1010	FXD CER 1000PF 250VAC	FOR UL & CSA
CR409	37-00-0082	LAMP LED RED	TOSHIBA TLR102KW
DL301	91-90-0003	DELAY LINE 1.3M Z=186 OHM	
R101	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R201	40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R1402	40-27-0562	FXD C FILM 56 OHM 5% 1/4W	
RV501	45-35-3107	VAR C COMP 10K OHM	V16L4N15KC
S1601	81-01-0270	PUSH SWITCH	ALPS SDG5P-E
T601	60-44-0110	POWER TRANS FOR 5000 SERIES	KIKUSUI S820041
V601	21-46-0611	CATHODE RAY TUBE	150CXB31
A1 ASSEMBLY			
C101	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV	
C102	57-10-1191	VAR CER 3-10PF	
C103	57-10-1181	VAR CER 3-6PF	
C104	52-06-2165	FXD CER 33PF 10% 500V TYPE1	
C105	57-10-1191	VAR CER 3-10PF	
C106	57-10-1181	VAR CER 3-6PF	
C107	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C108	52-06-2274	FXD CER 270P 10% 50V TYPE1	
C111	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV	
C112	52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2	
C113	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C114	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C115	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5041TM
C116	54-40-1200	FXD ELECT 10MF 50WV
C117	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C119	52-06-2102	FXD CER 10P 10% 50V TYPE1
C120	52-06-3145	FXD CER 22PF 10% 500V TYPE1
C121	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C122	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C131	57-10-1203	VAR CER 5-20PF
C132	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C133	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C151	52-06-2204	FXD CER 68P 10% 50V TYPE1
C152	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C153	54-40-1200	FXD ELECT 10MF 50WV
C171	57-10-1223	VAR CER 8-50PF
C172	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C173	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C174	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C175	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C176	52-06-2051	FXD CER 5P 10% 50V TYPE1
C177	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C178	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C179	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C181	52-06-2225	FXD CER 100PF 10% 50V TYPE1
C200	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C201	50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV
C202	57-10-1191	VAR CER 3-10PF
C203	57-10-1181	VAR CER 3-6PF
C204	52-06-2165	FXD CER 33PF 10% 500V TYPE1
C205	57-10-1191	VAR CER 3-10PF
C206	57-10-1181	VAR CER 3-6PF
C207	52-06-2274	FXD CER 270P 10% 50V TYPE1
C208	52-06-2274	FXD CER 270P 10% 50V TYPE1
C211	50-87-0510	FXD PLSTC FILM 2200PF 20% 400WV
C212	52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2
C213	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C214	52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C215	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C216	54-40-1200	FXD ELECT 10MF 50WV
C217	52-06-2125	FXD CER 15PF 10% 500V TYPE1
C219	52-06-2102	FXD CER 10P 10% 50V TYPE1
C220	52-06-3145	FXD CER 22PF 10% 500V TYPE1
C221	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C222	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C231	57-10-1203	VAR CER 5-20PF
C232	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C233	52-06-3051	FXD CER 5PF 10% 500V TYPE1
C251	52-06-2204	FXD CER 68P 10% 50V TYPE1
C252	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C271	57-10-1223	VAR CER 8-50PF
C272	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C273	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C274	52-06-2184	FXD CER 47PF 10% 50V TYPE1
C275	52-06-2265	FXD CER 220PF 10% 50V TYPE1
C277	52-06-2215	FXD CER 82PF 10% 500V TYPE1
C278	52-06-2215	FXD CER 82PF 10% 500V TYPE1

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5041TM		
C279		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C281		52-06-2225	FXD CER 100PF 10% 50V TYPE1		
C282		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C301		54-30-1970	FXD ELECT 100MF 25WV		
C302		54-30-1970	FXD ELECT 100MF 25WV		
C303		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C308		52-06-2155	FXD CER 27P 10% 50V TYPE1		
C309		52-06-2155	FXD CER 27P 10% 50V TYPE1		
C331		57-10-1203	VAR CER 5-20PF		
C332		52-06-2051	FXD CER 5P 10% 50V TYPE1		
C333		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C334		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C335		52-96-1140	FXD COMP 0.68PF 10% 500V		
C336		52-96-1140	FXD COMP 0.68PF 10% 500V		
C337		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C338		50-77-3500	FXD PLSTC FILM 0.047MF 20% 250WV		
C339		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C341		50-96-3590	FXD PLSTC FILM 0.022MF 20% 630WV		
C342		54-60-1740	FXD ELECT 1MF 160WV		
C343		52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2		
C344		50-67-0050	FXD PLSTC FILM 0.047MF 10% 100WV		
C345	*	52-06-2125	FXD CER 15PF 10% 500V TYPE1		
C346	*	52-06-2125	FXD CER 15PF 10% 500V TYPE1		
C347		54-40-1200	FXD ELECT 10MF 50WV		
C348		54-40-1200	FXD ELECT 10MF 50WV		
C349		52-06-2102	FXD CER 10P 10% 50V TYPE1		
C351		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C352		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C353		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C354		52-06-2145	FXD CER 22PF 10% 500V TYPE1		
C355		52-06-2145	FXD CER 22PF 10% 500V TYPE1		
C621		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C622		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV		
C623		54-60-1730	FXD ELECT 47MF 200WV		
C624		54-70-1080	FXD ELECT 2.2MF 250WV		
C625		54-60-1740	FXD ELECT 1MF 160WV		
C626		54-30-1830	FXD ELECT 1000MF 25WV		
C627		54-30-1830	FXD ELECT 1000MF 25WV		
C628		54-30-1960	FXD ELECT 47MF 25WV		
CR101		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR102		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR103		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR104		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR105		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR106		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR107		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR108		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR201		40-27-0000	JUMPER PARTS		
CR202		32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR203		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR204		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR205		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR206		32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5041TM		
CR207	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR208	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR301	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR311	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR314	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR317	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR318	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR319	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR320	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR621	32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR622	32-90-2110	DIODE BRIGE VRM=400V IO=1A	TOSHIBA	1G4B42
CR623	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR624	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR625	32-92-0130	ZENER VZ=12.4-13.1V P=0.4W	NEC	RD13JB1
CR626	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR627	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
Q101	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q102	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q103	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q104	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q105	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q106	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q107	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q108	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q109	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q110	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q111	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q201	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q202	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q203	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q204	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q205	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q206	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q207	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q208	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q210	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q211	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q212	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q213	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q301	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q302	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q305	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q306	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q307	30-31-7301	TR SI NPN	NEC	2SC1730-L
Q308	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q309	30-11-2061	TR SI PNP	NEC	2SA1206-L
Q310	30-31-7301	TR SI NPN	NEC	2SC1730-L
Q311	30-32-7531	TR SI NPN	TOSHIBA	2SC2753
Q312	30-11-1441	TR SI PNP	TOSHIBA	2SA1144-O
Q313	30-32-7041	TR SI NPN	TOSHIBA	2SC2704-O
Q314	30-32-7041	TR SI NPN	TOSHIBA	2SC2704-O
Q315	30-11-1441	TR SI PNP	TOSHIBA	2SA1144-O
Q316	30-32-7531	TR SI NPN	TOSHIBA	2SC2753

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM		
Q603	30-10-9580	TR SI PNP		KIKUSUI	S8309591
Q604	30-20-8341	TR SI PNP		TOSHIBA	2SB834-Y
Q605	30-40-8802	TR SI NPN		TOSHIBA	2SD880-Y
Q606	30-40-8802	TR SI NPN		TOSHIBA	2SD880-Y
QCR101	30-31-9071	TR SI NPN		HITACHI	2SC1907
QCR201	30-31-9071	TR SI NPN		HITACHI	2SC1907
R102	40-27-0332	FXD C FILM	33 OHM 5% 1/4W		
R103	42-33-0420	FXD M FILM	1M OHM 1% 1/2W		
R104	42-33-0390	FXD M FILM	900K OHM 0.5% 1/2W		
R105	42-82-4111	FXD M FILM	111K OHM 0.5% 1/4W		
R106	42-33-0400	FXD M FILM	990K OHM 0.5% 1/2W		
R107	42-82-3101	FXD M FILM	10.1K OHM 0.5% 1/4W		
R108	40-27-0152	FXD C FILM	15 OHM 5% 1/4W		
R109	40-27-0822	FXD C FILM	82 OHM 5% 1/4W		
R110	40-27-0152	FXD C FILM	15 OHM 5% 1/4W		
R111	40-37-4471	FXD C FILM	470K OHM 5% 1/2W		
R112	40-27-2102	FXD C FILM	1K OHM 5% 1/4W		
R113	40-27-2102	FXD C FILM	1K OHM 5% 1/4W		
R114	40-27-1392	FXD C FILM	390 OHM 5% 1/4W		
R115	40-27-1102	FXD C FILM	100 OHM 5% 1/4W		
R116	40-27-1682	FXD C FILM	680 OHM 5% 1/4W		
R117	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W		
R118	40-27-2822	FXD C FILM	8.2K OHM 5% 1/4W		
R119	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R120	40-27-2122	FXD C FILM	1.2K OHM 5% 1/4W		
R121	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R122	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R123	44-04-0000	FXD M GLAZE	R-NETWORK	KIKUSUI	S8109001
R124	38-00-0070	THERMISTOR	200 OHM		
R131	40-27-0102	FXD C FILM	10 OHM 5% 1/4W		
R132	40-27-1122	FXD C FILM	120 OHM 5% 1/4W		
R133	40-27-1122	FXD C FILM	120 OHM 5% 1/4W		
R134	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R135	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W		
R136	40-27-1682	FXD C FILM	680 OHM 5% 1/4W		
R137	40-27-3472	FXD C FILM	47K OHM 5% 1/4W		
R138	40-27-1102	FXD C FILM	100 OHM 5% 1/4W		
R139	42-83-1470	FXD M FILM	470 OHM 1% 1/4W		
R140	40-27-1272	FXD C FILM	270 OHM 5% 1/4W		
R141	42-83-1470	FXD M FILM	470 OHM 1% 1/4W		
R142	42-83-0560	FXD M FILM	56 OHM 1% 1/4W		
R144	42-83-0560	FXD M FILM	56 OHM 1% 1/4W		
R145	40-27-3472	FXD C FILM	47K OHM 5% 1/4W		
R146	40-27-0272	FXD C FILM	27 OHM 5% 1/4W		
R147	40-27-0272	FXD C FILM	27 OHM 5% 1/4W		
R148	42-83-1680	FXD M FILM	680 OHM 1% 1/4W		
R149	42-83-1680	FXD M FILM	680 OHM 1% 1/4W		
R150	40-27-0222	FXD C FILM	22 OHM 5% 1/4W		
R151	40-27-0222	FXD C FILM	22 OHM 5% 1/4W		
R152	40-27-1152	FXD C FILM	150 OHM 5% 1/4W		
R153	40-27-1152	FXD C FILM	150 OHM 5% 1/4W		
R154	40-27-0222	FXD C FILM	22 OHM 5% 1/4W		

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R155		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R156		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R157		40-27-1222	FXD C FILM 220 OHM 5% 1/4W	
R158	*	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R159		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R160		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R161		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R162		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R171		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R172		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R173		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R174		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R175		40-27-1182	FXD C FILM 180 OHM 5% 1/4W	
R176		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R177		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R178		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R179		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R180		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R186		40-27-0222	FXD C FILM 22 OHM 5% 1/4W	
R187		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R189		38-00-0070	THERMISTOR 200 OHM	
R202		40-27-0332	FXD C FILM 33 OHM 5% 1/4W	
R203		42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R204		42-33-0390	FXD M FILM 900K OHM 0.5% 1/2W	
R205		42-82-4111	FXD M FILM 111K OHM 0.5% 1/4W	
R206		42-33-0400	FXD M FILM 990K OHM 0.5% 1/2W	
R207		42-82-3101	FXD M FILM 10.1K OHM 0.5% 1/4W	
R208		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R209		40-27-0822	FXD C FILM 82 OHM 5% 1/4W	
R210		40-27-0152	FXD C FILM 15 OHM 5% 1/4W	
R211		40-37-4471	FXD C FILM 470K OHM 5% 1/2W	
R212		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R213		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R214		40-27-1392	FXD C FILM 390 OHM 5% 1/4W	
R215		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R216		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R217		40-27-2392	FXD C FILM 3.9K OHM 5% 1/4W	
R218		40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R219		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R220		40-27-2122	FXD C FILM 1.2K OHM 5% 1/4W	
R221		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R222		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R223		44-04-0000	FXD M GLAZE R-NETWORK	KIKUSUI S8109001
R224		38-00-0070	THERMISTOR 200 OHM	
R231		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R232		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R233		40-27-1122	FXD C FILM 120 OHM 5% 1/4W	
R234		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R235		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R236		40-27-1682	FXD C FILM 680 OHM 5% 1/4W	
R237		40-27-3472	FXD C FILM 47K OHM 5% 1/4W	
R238		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R239		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R240		40-27-1272	FXD C FILM 270 OHM 5% 1/4W	

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R241	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R242	42-83-0560	FXD M FILM 56	OHM 1% 1/4W
R244	42-83-0560	FXD M FILM 56	OHM 1% 1/4W
R245	40-27-3472	FXD C FILM 47K	OHM 5% 1/4W
R246	40-27-0272	FXD C FILM 27	OHM 5% 1/4W
R247	40-27-0272	FXD C FILM 27	OHM 5% 1/4W
R248	42-83-1680	FXD M FILM 680	OHM 1% 1/4W
R249	42-83-1680	FXD M FILM 680	OHM 1% 1/4W
R250	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R251	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R252	40-27-1152	FXD C FILM 150	OHM 5% 1/4W
R253	40-27-1152	FXD C FILM 150	OHM 5% 1/4W
R254	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R255	42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R256	42-83-2100	FXD M FILM 1K	OHM 1% 1/4W
R257	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R258	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R271	40-27-1122	FXD C FILM 120	OHM 5% 1/4W
R272	40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R273	40-27-2152	FXD C FILM 1.5K	OHM 5% 1/4W
R274	40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R275	40-27-1182	FXD C FILM 180	OHM 5% 1/4W
R276	40-27-1102	FXD C FILM 100	OHM 5% 1/4W
R277	40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R278	40-27-2562	FXD C FILM 5.6K	OHM 5% 1/4W
R279	40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R282	40-27-0472	FXD C FILM 47	OHM 5% 1/4W
R283	40-27-2122	FXD C FILM 1.2K	OHM 5% 1/4W
R284	40-27-2682	FXD C FILM 6.8K	OHM 5% 1/4W
R285	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R286	40-27-0222	FXD C FILM 22	OHM 5% 1/4W
R287	40-27-2222	FXD C FILM 2.2K	OHM 5% 1/4W
R301	40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R302	40-27-0102	FXD C FILM 10	OHM 5% 1/4W
R303	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R304	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R305	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R306	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R307	40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R308	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R309	40-27-0822	FXD C FILM 82	OHM 5% 1/4W
R310	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R311	40-27-1222	FXD C FILM 220	OHM 5% 1/4W
R315	40-27-2102	FXD C FILM 1K	OHM 5% 1/4W
R320	44-07-0020	FXD M GLAZE RESISTOR NETWORKS	10K OHM X4
R322	40-27-0000	JUMPER PARTS	
R331	42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R332	42-83-0910	FXD M FILM 91	OHM 1% 1/4W
R333	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R334	42-83-1470	FXD M FILM 470	OHM 1% 1/4W
R335	40-27-1822	FXD C FILM 820	OHM 5% 1/4W
R336	40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R337	40-27-1682	FXD C FILM 680	OHM 5% 1/4W
R338	40-27-2102	FXD C FILM 1K	OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R339		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R341	*	40-27-3332	FXD C FILM	33K OHM 5% 1/4W
R342		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R343		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R344		40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R345		40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R346		44-91-3330	FXD M OXIDE	33K OHM 5% 1W
R347		44-91-3330	FXD M OXIDE	33K OHM 5% 1W
R348		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R349		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R350		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R351		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R352		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R353		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R354		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R355		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R356		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R357		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R358		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R359		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R360		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R361		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R362		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R363		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R364		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R365		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R366		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R367		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R368	*	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R369		40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R370		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R371		40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R374		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R375		40-27-1122	FXD C FILM	120 OHM 5% 1/4W
R376		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R621		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R622		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R623		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R624		40-27-0102	FXD C FILM	10 OHM 5% 1/4W
R625		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R626		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R627		40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R628		42-83-4120	FXD M FILM	120K OHM 1% 1/4W
R629		42-83-3100	FXD M FILM	10K OHM 1% 1/4W
R630		44-92-2270	FXD M OXIDE	2.7K OHM 5% 2W
R631		44-91-8101	FXD MOR 1	OHM 5% 1W
R632		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R633		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R634		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R635		40-37-8222	FXD C FILM	2.2 OHM 5% 1/2W
R636		44-91-1100	FXD M OXIDE	100 OHM 5% 1W
R637		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R638		42-83-3120	FXD M FILM	12K OHM 1% 1/4W
R639		42-83-3120	FXD M FILM	12K OHM 1% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM	
R640		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W		
R641		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W		
R642		42-83-2390	FXD M FILM 3.9K OHM 1% 1/4W		
R643		42-83-2910	FXD M FILM 9.1K OHM 1% 1/4W		
R644	*	40-27-1152	FXD C FILM 150 OHM 5% 1/4W		
R645		44-91-1100	FXD M OXIDE 100 OHM 5% 1W		
R646		40-37-1101	FXD C FILM 100 OHM 5% 1/2W		
RV101		48-33-3200	VAR M FILM 20K OHM		
RV102		48-33-1100	VAR M FILM 100 OHM		
RV103		48-33-1500	VAR M FILM 500 OHM		
RV105		48-33-3200	VAR M FILM 20K OHM		
RV106		48-33-1100	VAR M FILM 100 OHM		
RV107		48-33-2100	VAR M FILM 1K OHM		
RV108		48-33-2200	VAR M FILM 2K OHM		
RV109		48-33-1200	VAR M FILM 200 OHM		
RV110		48-33-2100	VAR M FILM 1K OHM		
RV112		48-33-3200	VAR M FILM 20K OHM		
RV201		48-33-3200	VAR M FILM 20K OHM		
RV202		48-33-1100	VAR M FILM 100 OHM		
RV203		48-33-1500	VAR M FILM 500 OHM		
RV205		48-33-3200	VAR M FILM 20K OHM		
RV207		48-33-2100	VAR M FILM 1K OHM		
RV209		48-33-1200	VAR M FILM 200 OHM		
RV210		48-33-2100	VAR M FILM 1K OHM		
RV212		48-33-3200	VAR M FILM 20K OHM		
RV301		48-33-1500	VAR M FILM 500 OHM		
RV302		48-33-2200	VAR M FILM 2K OHM		
RV606		48-33-2100	VAR M FILM 1K OHM		
S101		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS	S21P2YC
S102		82-70-8231	LEVER SWITCH	ALPS	SLR823-1
S201		80-98-0580	SW ROTARY WITH RV VOLT/DIV	ALPS	S21P2YC
S202		82-70-8231	LEVER SWITCH	ALPS	SLR823-1
S301		82-70-8231	LEVER SWITCH	ALPS	SLR823-1
U101		34-00-0121	FET OPE-AMP	N.S	LF13741N
U102		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA	CA3086
U201		34-00-0121	FET OPE-AMP	N.S	LF13741N
U202		30-90-0141	TRANSISTOR ARRAYS 5 NPN	RCA	CA3086
U301		35-70-0741	DUAL D F-F EDGE TRIGGER	TEXAS INS.	HD74LS74P
U302		35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS.	SN74LS00N
U602		34-00-0240	DUAL OPE-AMP	NEC	UPC4558C
U603		34-00-0240	DUAL OPE-AMP	NEC	UPC4558C

A2 ASSEMBLY

C401		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2	
C402		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV	
C403		52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C404		52-06-2184	FXD CER 47PF 10% 50V TYPE1	
C405	*	52-01-3305	FXD CER 470PF 10% 500V TYPE2	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION COS5041TM
C406		54-30-1960	FXD ELECT 47MF 25WV
C407		54-30-1960	FXD ELECT 47MF 25WV
C408		54-40-1200	FXD ELECT 10MF 50WV
C409		54-40-1200	FXD ELECT 10MF 50WV
C410		54-40-1200	FXD ELECT 10MF 50WV
C411	*	52-06-2225	FXD CER 100PF 10% 50V TYPE1
C431		55-37-2050	FXD TANT ELECT 1UF 35V
C432		54-40-1200	FXD ELECT 10MF 50WV
C433		50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV
C435		52-06-2155	FXD CER 27P 10% 50V TYPE1
C451		52-06-2184	FXD CER 47PF 10% 50V TYPE1
C452		54-40-1200	FXD ELECT 10MF 50WV
C454		52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C455		52-06-2184	FXD CER 47PF 10% 50V TYPE1
C456		54-40-1200	FXD ELECT 10MF 50WV
C457		54-30-1960	FXD ELECT 47MF 25WV
C458		52-06-2225	FXD CER 100PF 10% 50V TYPE1
C459		50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV
C460		50-65-0540	FXD M PLSTC FILM 1UF 5% 100WV
C461		54-30-1960	FXD ELECT 47MF 25WV
C462		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C463		54-40-1200	FXD ELECT 10MF 50WV
C464		54-40-1200	FXD ELECT 10MF 50WV
C465		52-06-2125	FXD CER 15PF 10% 500V TYPE1
C467		52-01-3345	FXD CER 1000PF 10% 500V TYPE2
C468		50-67-0030	FXD PLSTC FILM 0.01MF 10% 100WV
C469		52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2
C503		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C504		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C506		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C507		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C508		54-40-1200	FXD ELECT 10MF 50WV
C509		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C510		54-40-1200	FXD ELECT 10MF 50WV
C651		54-40-1200	FXD ELECT 10MF 50WV
C652		54-40-1200	FXD ELECT 10MF 50WV
C653		52-01-3385	FXD CER 2220PF 10% 500V TYPE2
C654		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C655		54-40-1210	FXD ELECT 22MF 50WV
C656		55-37-2050	FXD TANT ELECT 1UF 35V
C659		52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1
C660		52-98-1020	FXD CER 1000PF +80 - -20% 3.15KV
C661		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C662		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C663		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C664		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2
C665		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C666		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C668		52-08-5145	FXD CER 22PF 10% 2KV TYPE1
C669		50-67-0040	FXD PLSTC FILM 0.022MF 10% 100WV
C671		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C672		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C673		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1
C674		52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5041TM		
C675	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C676	52-98-1010	FXD CER 1000PF +80-20% 6.3KV TYPE1		
C677	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C678	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C679	52-98-1000	FXD CER 4700PF +80-20% 3.15KV TYPE1		
C681	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C682	52-06-2265	FXD CER 220PF 10% 50V TYPE1		
C683	54-40-1200	FXD ELECT 10MF 50WV		
C684	54-40-1200	FXD ELECT 10MF 50WV		
C685	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C686	54-40-1200	FXD ELECT 10MF 50WV		
C687	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C688	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C689	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C701	52-06-2184	FXD CER 47PF 10% 50V TYPE1		
C702	50-65-0530	FXD M PLSTC FILM 1000PF 5% 100WV		
C703	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
C704	54-40-1200	FXD ELECT 10MF 50WV		
C705	54-40-1200	FXD ELECT 10MF 50WV		
C707	52-05-2468	FXD CER 0.01UF +80-20% 50V TYPE2		
CR401	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR402	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR403	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR404	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR452	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR453	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR454	32-92-0033	ZENER VZ=3.2 - 3.4V	HITACHI	HZ3C-2
CR455	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR456	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR457	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR458	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR459	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR460	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR461	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR462	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR463	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR464	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR465	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR468	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR469	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR501	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR502	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR503	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR504	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR651	32-92-0056	ZENER VZ=5.5 - 5.8V P=0.4W	NEC	RD5.6JB2
CR652	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR653	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR654	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR657	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR658	32-90-1820	DIODE VR=2KV FAST RECOVERY	HITACHI	ERB26-20
CR659	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR660	32-90-2620	DIODE VR=200V FAST RECOVERY		BAV21
CR661	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION COS5041TM		
CR662	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR663	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR664	32-30-0830	DIODE VR=250V IO=200MA	HITACHI	1SS83
CR665	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR666	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR667	32-92-0022	ZENER VZ=2.1 - 2.3V	HITACHI	HZ2B-3
CR668	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR669	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR670	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR681	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR682	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR683	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR684	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR685	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR686	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR687	32-90-1951	DIODE VR=6KV FAST RECOVERY	SANKEN	GHV-06SSN
CR701	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR702	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR703	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR704	32-30-0860	DIODE VR=30V IO=30MA	HITACHI	1SS86
CR705	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR706	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR707	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR708	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR709	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
DS651	23-70-0100	LAMP NEON		
DS652	23-70-0100	LAMP NEON		
L650	67-10-0890	INDUCTOR 100MH 10%		
Q401	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q402	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q403	31-20-1073	FET IDSS=4.5-7.7MA	SONY	2SK107-3
Q404	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q405	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q406	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q407	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q408	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q409	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q410	31-20-1171	FET	TOSHIBA	2SK117-BL
Q411	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q412	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q413	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q415	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q416	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q417	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q418	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q419	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q420	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q421	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q422	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q423	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q424	30-31-8431	TR SI NPN	NEC	2SC1843-E

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM	
Q425	31-20-1171	FET	TOSHIBA	2SK117-BL
Q426	31-20-1171	FET	TOSHIBA	2SK117-BL
Q427	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q428	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q429	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q430	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q431	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q501	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q502	30-11-0151	TR SI PNP	TOSHIBA	2SA1015-Y
Q503	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q504	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q505	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q506	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q507	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q508	30-10-8381	TR SI PNP	MATSUSITA	2SA838-B
Q509	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q510	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q511	30-40-6681	TR SI NPN	HITACHI	2SD668A-C
Q512	30-20-6481	TR SI PNP	HITACHI	2SB648A
Q651	30-40-8804	TR SI NPN	TOSHIBA	2SD880-O
Q652	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q654	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q655	30-31-9071	TR SI NPN	HITACHI	2SC1907
Q656	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q657	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q658	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q659	30-32-3710	TR SI NPN	NEC	2SC2371-L
Q660	31-20-1171	FET	TOSHIBA	2SK117-BL
Q702	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q703	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q704	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q705	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q706	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q707	30-30-9451	TR SI NPN	NEC	2SC945-Q
Q708	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q709	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q710	31-20-1171	FET	TOSHIBA	2SK117-BL
Q711	30-31-8431	TR SI NPN	NEC	2SC1843-E
Q712	30-10-8441	TR SI PNP	HITACHI	2SA844-D
Q713	30-10-8441	TR SI PNP	HITACHI	2SA844-D

R401	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R402	42-83-2100	FXD M FILM	1K	OHM	1%	1/4W
R403	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R404	40-27-2122	FXD C FILM	1.2K	OHM	5%	1/4W
R405	40-27-2222	FXD C FILM	2.2K	OHM	5%	1/4W
R406	40-27-2332	FXD C FILM	3.3K	OHM	5%	1/4W
R407	40-27-0472	FXD C FILM	47	OHM	5%	1/4W
R408	40-27-3472	FXD C FILM	47K	OHM	5%	1/4W
R409	42-33-0420	FXD M FILM	1M	OHM	1%	1/2W
R410	40-27-3102	FXD C FILM	10K	OHM	5%	1/4W
R411	40-27-2152	FXD C FILM	1.5K	OHM	5%	1/4W
R412	40-27-1272	FXD C FILM	270	OHM	5%	1/4W
R413	40-27-1562	FXD C FILM	560	OHM	5%	1/4W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R414	40-27-0682	FXD C FILM	68 OHM 5% 1/4W
R415	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R416	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R417	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R418	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R419	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R420	40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R421	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R422	40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R423	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R424	40-27-3222	FXD C FILM	22K OHM 5% 1/4W
R425	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R427	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R428	40-27-0332	FXD C FILM	33 OHM 5% 1/4W
R429	40-27-1562	FXD C FILM	560 OHM 5% 1/4W
R431	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R432	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R433	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R434	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R435	40-27-1392	FXD C FILM	390 OHM 5% 1/4W
R436	40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R437	40-27-1272	FXD C FILM	270 OHM 5% 1/4W
R438	40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R439	40-27-0000	JUMPER PARTS	
R440	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R441	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R442	40-27-8472	FXD C FILM	4.7 OHM 5% 1/4W
R443	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R444	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R452	40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R453	40-27-0222	FXD C FILM	22 OHM 5% 1/4W
R454	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R455	40-27-2182	FXD C FILM	1.8K OHM 5% 1/4W
R456	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R458	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R459	40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R460	40-27-3472	FXD C FILM	47K OHM 5% 1/4W
R461	42-72-3210	FXD M FILM	21K OHM 1% 1/4W
R462	42-83-3330	FXD M FILM	33K OHM 1% 1/4W
R463	40-27-2272	FXD C FILM	2.7K OHM 5% 1/4W
R466	40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R467	40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R468	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R469	40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R470	40-27-1822	FXD C FILM	820 OHM 5% 1/4W
R471	40-27-3562	FXD C FILM	56K OHM 5% 1/4W
R472	40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R473	40-27-2122	FXD C FILM	1.2K OHM 5% 1/4W
R475	40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R476	40-27-3182	FXD C FILM	18K OHM 5% 1/4W
R477	40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R478	42-83-2220	FXD M FILM	2.2K OHM 1% 1/4W
R479	40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R480	40-27-3102	FXD C FILM	10K OHM 5% 1/4W

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R481		40-27-3332	FXD C FILM 33K OHM 5% 1/4W	
R482		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R483		40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R484		42-83-2160	FXD M FILM 1.6K OHM 1% 1/4W	
R485		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R486		40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R487		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R488		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R489		40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R491		42-24-0231	FXD M GLAZE 5M OHM 1% 0.31W	
R492		42-33-0420	FXD M FILM 1M OHM 1% 1/2W	
R493		44-04-0010	FXD M GLAZE R-NETWORK	KIKUSUI S8109011
R494		42-83-2390	FXD M FILM 3.9K OHM 1% 1/4W	
R495		42-83-1470	FXD M FILM 470 OHM 1% 1/4W	
R496		40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R498		40-27-1562	FXD C FILM 560 OHM 5% 1/4W	
R499		40-27-1102	FXD C FILM 100 OHM 5% 1/4W	
R501		40-27-2682	FXD C FILM 6.8K OHM 5% 1/4W	
R502		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R503		42-83-0560	FXD M FILM 56 OHM 1% 1/4W	
R504		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R505		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R506		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R507		40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R508		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R509		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R510		42-83-2100	FXD M FILM 1K OHM 1% 1/4W	
R511		42-83-1560	FXD M FILM 560 OHM 1% 1/4W	
R512		40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R513		40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R514		40-27-3122	FXD C FILM 12K OHM 5% 1/4W	
R515		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R516		40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R517		40-27-2222	FXD C FILM 2.2K OHM 5% 1/4W	
R518		42-83-4100	FXD M FILM 100K OHM 1% 1/4W	
R519		42-83-4100	FXD M FILM 100K OHM 1% 1/4W	
R520		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R521		40-27-4102	FXD C FILM 100K OHM 5% 1/4W	
R522		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R523		40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R524		40-27-2152	FXD C FILM 1.5K OHM 5% 1/4W	
R525		40-27-1332	FXD C FILM 330 OHM 5% 1/4W	
R526		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R527		40-27-0472	FXD C FILM 47 OHM 5% 1/4W	
R651		42-83-2820	FXD M FILM 8.2K OHM 1% 1/4W	
R652		42-83-3120	FXD M FILM 12K OHM 1% 1/4W	
R653	*	40-27-4122	FXD C FILM 120K OHM 5% 1/4W	
R654		42-83-4100	FXD M FILM 100K OHM 1% 1/4W	
R655		40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R657		44-91-8101	FXD MOR 1 OHM 5% 1W	
R658		40-27-2472	FXD C FILM 4.7K OHM 5% 1/4W	
R659		40-27-1472	FXD C FILM 470 OHM 5% 1/4W	
R661		42-44-0310	FXD M GLAZE 6.8M OHM 1% 1.6W	
R662		42-44-0330	FXD THICK FILM 10M OHM 1% 1W	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R663		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R664		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R665		40-37-5221	FXD C FILM	2.2M OHM 5% 1/2W
R666		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R667		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R668		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R669		40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R670	*	40-27-3272	FXD C FILM	27K OHM 5% 1/4W
R671		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R673		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R674		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R675		40-37-6101	FXD C FILM	10M OHM 5% 1/2W
R676		40-37-5151	FXD C FILM	1.5M OHM 5% 1/2W
R677		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R678		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R679		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R680		40-27-4472	FXD C FILM	470K OHM 5% 1/4W
R681		40-27-2182	FXD C FILM	1.8K OHM 5% 1/4W
R683		40-27-2332	FXD C FILM	3.3K OHM 5% 1/4W
R684		40-27-2222	FXD C FILM	2.2K OHM 5% 1/4W
R685		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R686		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R687		40-27-2562	FXD C FILM	5.6K OHM 5% 1/4W
R688		40-27-1332	FXD C FILM	330 OHM 5% 1/4W
R689		40-27-2472	FXD C FILM	4.7K OHM 5% 1/4W
R690		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R691		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R692		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R693		40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R694		40-27-1682	FXD C FILM	680 OHM 5% 1/4W
R695		40-37-3471	FXD C FILM	47K OHM 5% 1/2W
R696		40-27-1102	FXD C FILM	100 OHM 5% 1/4W
R697		40-27-4102	FXD C FILM	100K OHM 5% 1/4W
R698	*	40-27-3392	FXD C FILM	39K OHM 5% 1/4W
R699		40-27-3562	FXD C FILM	56K OHM 5% 1/4W
R702		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R703		40-27-1472	FXD C FILM	470 OHM 5% 1/4W
R704		40-27-2152	FXD C FILM	1.5K OHM 5% 1/4W
R705		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R706		40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R707		40-27-3182	FXD C FILM	18K OHM 5% 1/4W
R708		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R709		40-27-3562	FXD C FILM	56K OHM 5% 1/4W
R711		40-27-2102	FXD C FILM	1K OHM 5% 1/4W
R712		40-27-0472	FXD C FILM	47 OHM 5% 1/4W
R713		40-27-3102	FXD C FILM	10K OHM 5% 1/4W
R714		42-83-3330	FXD M FILM	33K OHM 1% 1/4W
R715		42-72-3210	FXD M FILM	21K OHM 1% 1/4W
R716		40-27-2122	FXD C FILM	1.2K OHM 5% 1/4W
R717		40-27-3182	FXD C FILM	18K OHM 5% 1/4W
R718		40-27-2392	FXD C FILM	3.9K OHM 5% 1/4W
R719		40-27-1222	FXD C FILM	220 OHM 5% 1/4W
R720		42-83-2100	FXD M FILM	1K OHM 1% 1/4W
R721		42-83-2220	FXD M FILM	2.2K OHM 1% 1/4W

REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM
R722	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R723	40-27-2562	FXD C FILM 5.6K OHM 5% 1/4W	
R724	44-25-0001	FXD M GLAZE R-NETWORK	
R725	40-27-0102	FXD C FILM 10 OHM 5% 1/4W	
R730	40-27-2182	FXD C FILM 1.8K OHM 5% 1/4W	
R1401	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1403	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1404	40-27-4472	FXD C FILM 470K OHM 5% 1/4W	
R1405	40-27-2102	FXD C FILM 1K OHM 5% 1/4W	
R1652	40-27-3152	FXD C FILM 15K OHM 5% 1/4W	
R1654	40-27-2332	FXD C FILM 3.3K OHM 5% 1/4W	
R1661	40-37-6101	FXD C FILM 10M OHM 5% 1/2W	
R1662	40-37-3221	FXD C FILM 22K OHM 5% 1/2W	
RV401	48-33-2500	VAR M FILM 5K OHM	
RV404	48-33-4500	VAR M FILM 500K OHM	
RV405	48-33-3100	VAR M FILM 10K OHM	
RV651	48-26-5220	VAR M GLAZE 2.2M OHM	
RV652	48-33-4100	VAR M FILM 100K OHM	
RV653	48-33-3200	VAR M FILM 20K OHM	
RV702	48-33-2100	VAR M FILM 1K OHM	
RV703	48-33-2200	VAR M FILM 2K OHM	
S401	82-70-5231	LEVER SWICH	
S402	82-70-5242	LEVER SWITCH	ALPS SLR524-2
S403	82-70-5222	PUSH SWITCH	ALPS SLR522-2
S406	80-98-0610	SW ROTALY WITH RV A SWEEP/DIV	ALPS S21P 2421/RV
S701	80-98-0620	SW ROTALY B SWEEP/DIV	KIKUSUI 3155560
T651	63-92-0130	CONVERTOR TRANS	KIKUSUI S810115
U401	35-70-0003	QUAD 2-INPUT POSI-NAND	FAIRCHILD 74F00PC
U402	35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.SN74LS112N
U403	34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
U404	34-69-0030	TRIPLE 2-CHANNEL MULTIPLEXER	TOSHIBA TC4053BP
U651	34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP
U701	35-70-1121	DUAL J-K F-F WITH P/C	TEXAS INS.SN74LS112N
U702	35-70-0001	QUAD 2-INPUT POSI-NAND	TEXAS INS.SN74LS00N
U703	34-00-0215	J-FET INPUT OPE-AMP	TEXAS INS.TL081CP

A3 ASSEMBLY

C453	52-01-3345	FXD CER 1000PF 10% 500V TYPE2	
C466	52-05-1498	FXD CER 0.1UF +80-20% 25V TYPE2	
CR451	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA 1S1588
R426	40-27-2822	FXD C FILM 8.2K OHM 5% 1/4W	
R457	40-27-3102	FXD C FILM 10K OHM 5% 1/4W	
R731	44-07-0020	FXD M GLAZE RESISTOR NETWORKS	10K OHM X4
RV402	45-01-0550	VAR C COMP 10K/100K OHM B	

REFERENCE DESIGNATOR		KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM	
S404		81-03-0270	PUSH SWITCH	ALPS	SUE30
S702		81-04-0260	PUSH SWITCH	ALPS	SUE40

A4 ASSEMBLY

C1605		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C1606		50-45-0500	FXD PLSTC FILM 0.01MF 5% 50VWV		
C1607		52-06-2051	FXD CER 5P 10% 50V TYPE1		
C1608		52-01-3345	FXD CER 1000PF 10% 500V TYPE2		
C1609		54-30-1960	FXD ELECT 47MF 25WV		
C1610		52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
CR1601		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1602		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1603		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1604		32-92-0360	ZENER VZ=35.3-36.8V	HITACHI	HZ36L-2
CR1605		37-00-0061	LAMP LED GREEN	TOSHIBA	TLG145
DS1601		23-44-0000	LAMP FILAMENT 14V 80MA		
DS1602		23-44-0000	LAMP FILAMENT 14V 80MA		
Q1601		30-31-8461	TR SI NPN	MATSUSITA	2SC1846-R
Q1602		30-31-8461	TR SI NPN	MATSUSITA	2SC1846-R
R1601	*	40-27-4102	FXD C FILM 100K OHM 5% 1/4W		
R1602		40-27-3102	FXD C FILM 10K OHM 5% 1/4W		
R1603		40-27-3102	FXD C FILM 10K OHM 5% 1/4W		
R1604		40-27-4102	FXD C FILM 100K OHM 5% 1/4W		
R1605		40-27-4102	FXD C FILM 100K OHM 5% 1/4W		
R1606		40-27-4222	FXD C FILM 220K OHM 5% 1/4W		
R1607		40-27-4472	FXD C FILM 470K OHM 5% 1/4W		
R1608		40-27-4472	FXD C FILM 470K OHM 5% 1/4W		
R1609		40-27-1472	FXD C FILM 470 OHM 5% 1/4W		
R1610		42-83-3120	FXD M FILM 12K OHM 1% 1/4W		
R1611	*	40-27-3682	FXD C FILM 68K OHM 5% 1/4W		
R1612		42-83-1470	FXD M FILM 470 OHM 1% 1/4W		
R1613		40-27-0102	FXD C FILM 10 OHM 5% 1/4W		
R1614		40-27-1682	FXD C FILM 680 OHM 5% 1/4W		
R1615		40-27-8472	FXD C FILM 4.7 OHM 5% 1/4W		
R1616		40-27-1562	FXD C FILM 560 OHM 5% 1/4W		
RV706		45-43-3100	VAR M GLAZE 10K OHM		
RV1601		45-44-3101	VAR C COMP 10K OHM		V16L6SN15KC
RV1603		45-44-4201	VAR C COMP 200K OHM		V16L6SN15KC
RV1604		45-43-2200	VAR M GLAZE 2K OHM		
RV1605		45-44-3101	VAR C COMP 10K OHM		V16L6SN15KC
U1601		35-60-0000	QUAD 2-INPUT NAND GATES	TOSHIBA	TC4011BP

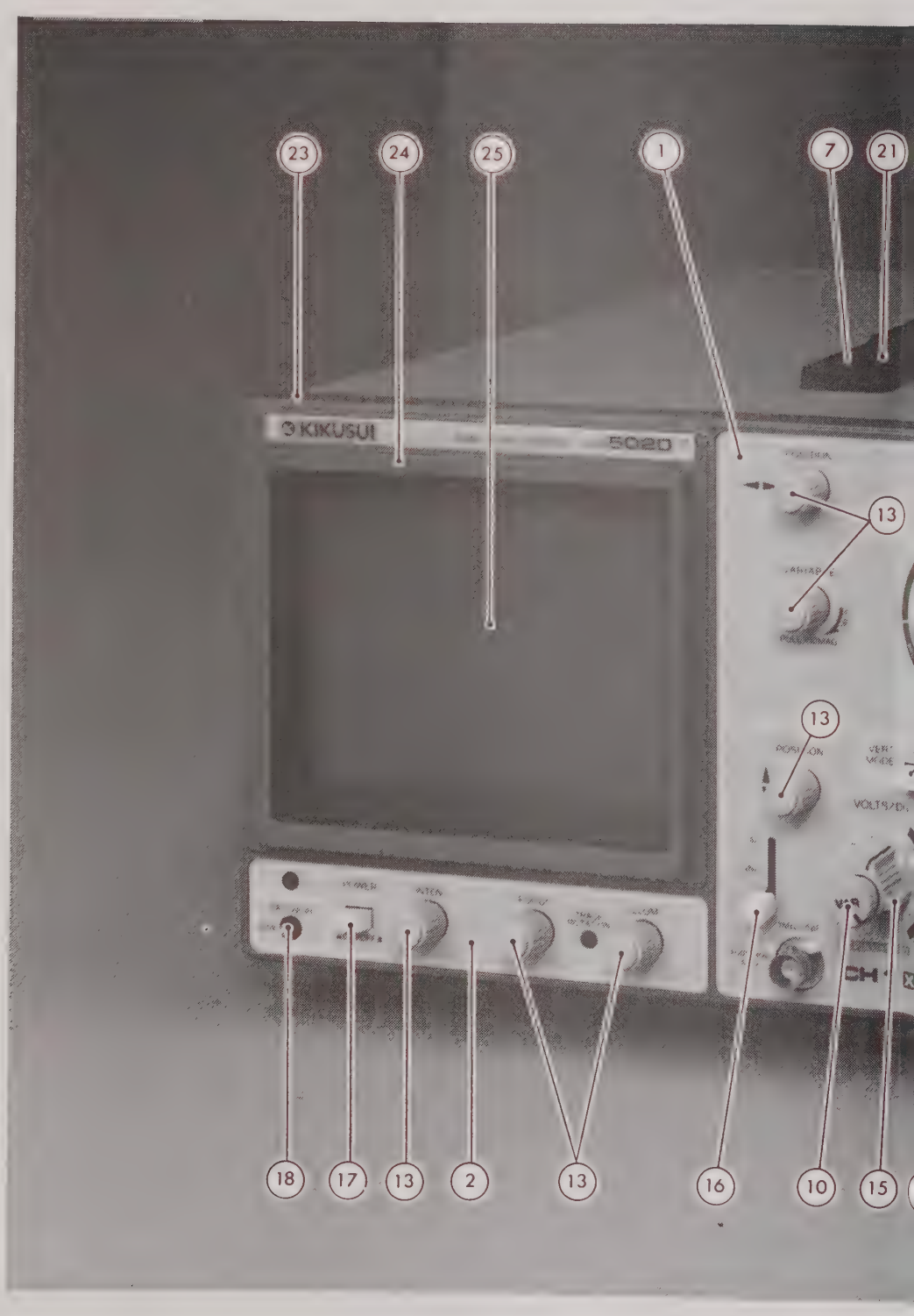
REFERENCE DESIGNATOR	KIKUSUI PARTS NO.	DESCRIPTION	COS5041TM

A5 ASSEMBLY

C1301	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
C1302	52-03-3469	FXD CER 0.01UF +100-0% 500V TYPE2		
CR305	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
CR309	32-11-5880	DIODE VR=30V IO=120MA	TOSHIBA	1S1588
RV111	45-35-3108	VAR C COMP 10K OHM		V16L4SN15KC
RV211	45-01-0681	VAR C COMP 10K OHM WITH SW		V16L4SN15KC
S302	81-05-0260	PUSH SWITCH	KIKUSUI	S8508921

COS5020TM/COS5040TM

NO.	CODE NO.	DESCRIPTION	REMARK
1	A1－510－001	FRONT PANEL	
2	A1－510－002	FRONT PANEL CRT	
3	B1－510－001	COVER	
4	B4－510－002	BOTTOM PLATE	
5	B6－510－001	PLATE REAR	REAR
6	C1－510－001	SUB PANEL	BEHIND FRONT PANEL
7	E6－510－002	HANDLE BRACKET	
8	E7－507－101	STAND (202×100)	BOTTOM
9	L4－510－001	GND TERMINAL	
10	N1－510－003	KNOB R12W	
11	N1－510－005	KNOB R11W	
12	N1－510－006	KNOB R13W	
13	N1－510－008	KNOB R11S	
14	N1－510－009	KNOB D22S	
15	N1－510－011	KNOB D18W	
16	N9－510－001	KNOB FOR LEVER SWITCH	
17	N9－510－002	PUSH BUTTON	
18	P2－000－291	CAL TERMINAL	
19	P2－000－381	FOOT (20－17)	BOTTOM
20	P2－050－141	STAND BRACKET	
21	P2－510－001	BRACKET FOR HANDLE	
22	P6－403－901	HANDLE	
23	P9－510－001	FRONT FRAME	
24	P9－510－002	BEZEL	
25	S4－510－001	FILTER (GRAY)	
26	P3－510－001	CORD HOLDER	REAR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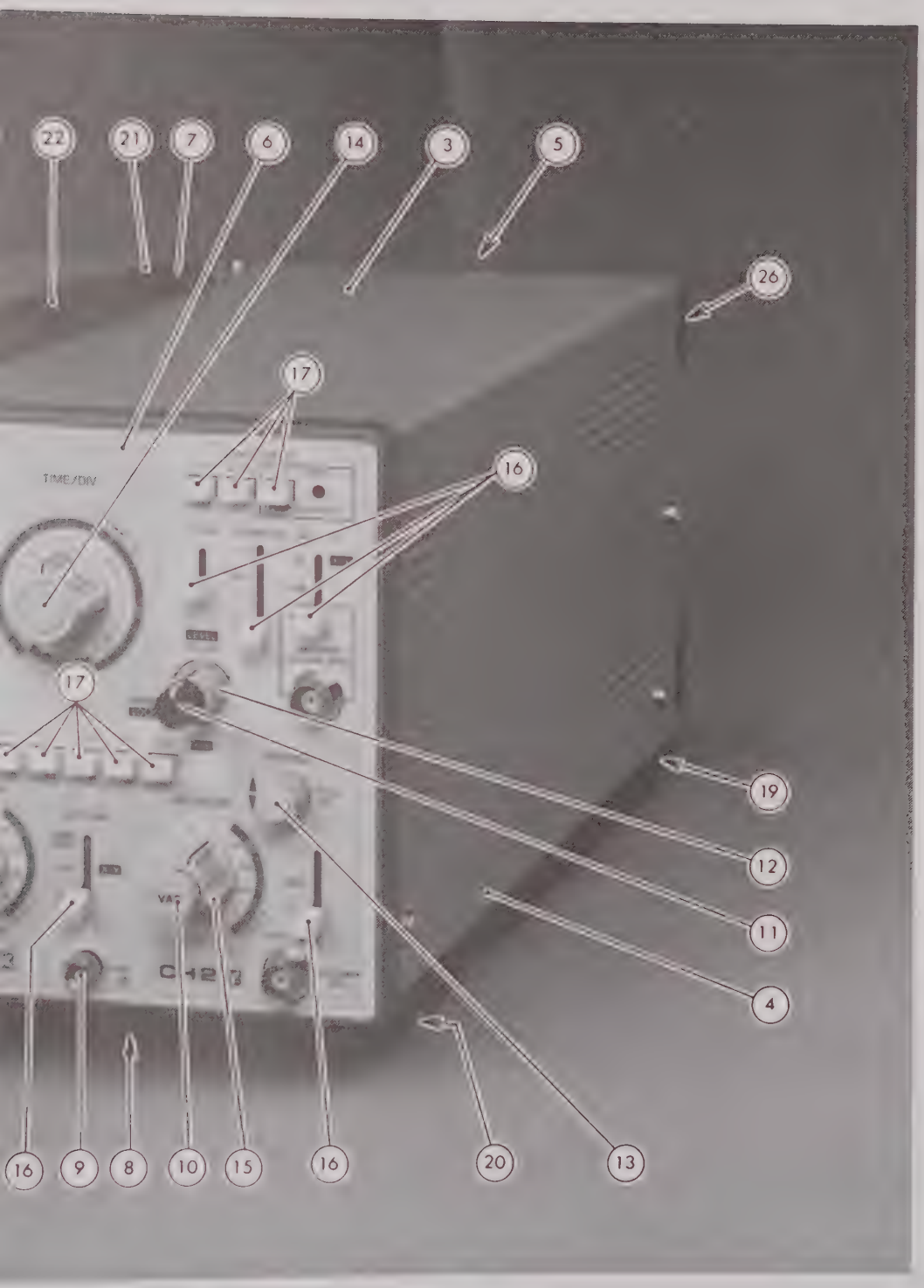
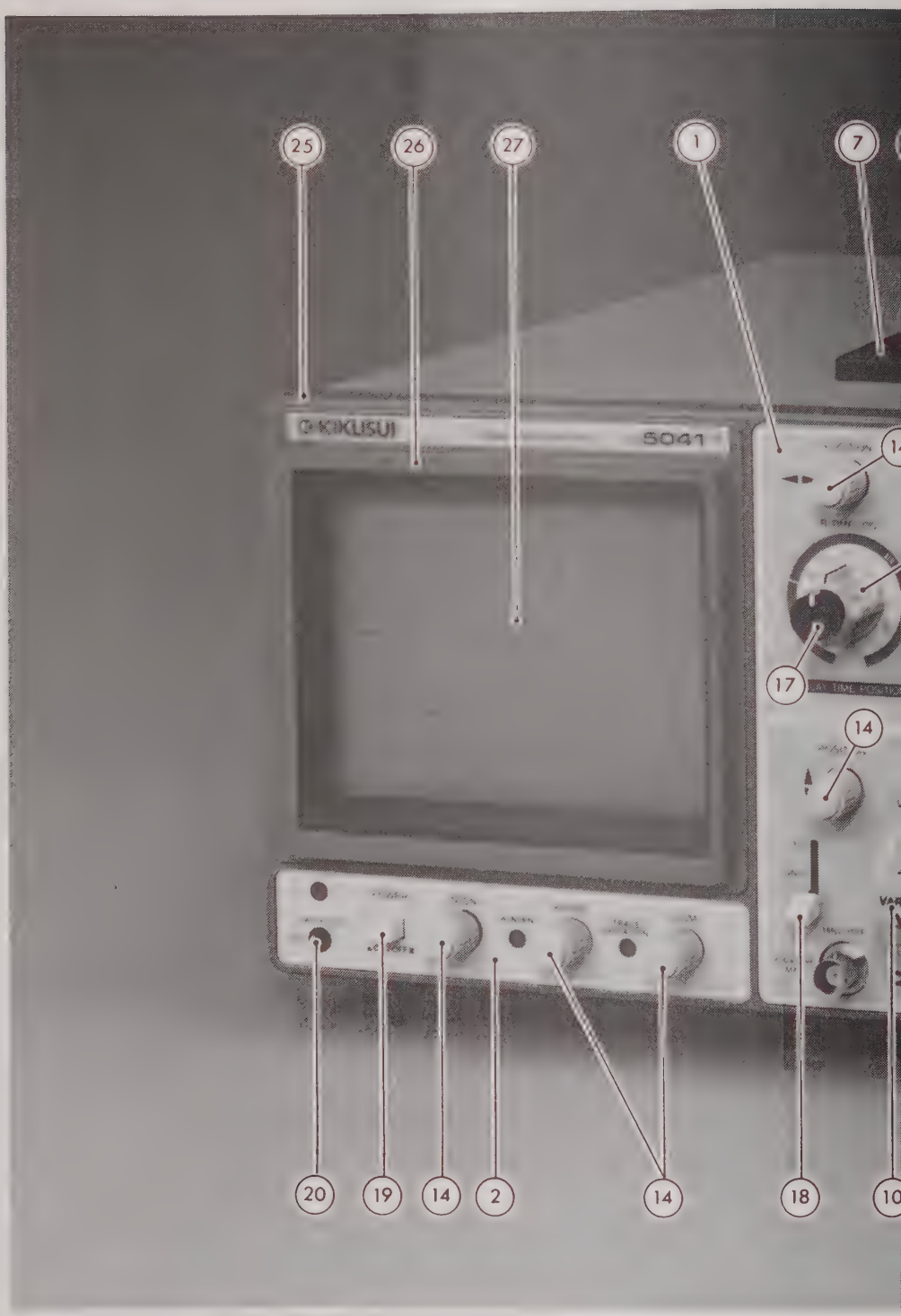


M MECHANICAL PARTS

COS5021TM/COS5041TM

NO.	CODE NO.	DESCRIPTION	REMARK
1	A1－510－101	FRONT PANEL	
2	A1－510－102	FRONT PANEL (CRT)	
3	B1－510－001	COVER	
4	B4－510－002	BOTTOM PLATE	
5	B6－510－001	PLATE REAR	REAR
6	C1－510－001	SUB PANEL	BEHIND FRONT PANEL
7	E6－510－002	HANDLE BRACKET	
8	E7－507－101	STAND (202×100)	BOTTOM
9	L4－510－001	GND TERMINAL	
10	N1－510－003	KNOB R12W	
11	N1－510－004	KNOB R14W	
12	N1－510－005	KNOB R11W	
13	N1－510－006	KNOB R13W	
14	N1－510－008	KNOB R11S	
15	N1－510－010	KNOB D22W	
16	N1－510－011	KNOB D18W	
17	N1－510－012	KNOB R12W	
18	N9－510－001	KNOB FOR LEVER SWITCH	
19	N9－510－002	PUSH BUTTON	
20	P2－000－291	CAL TERMINAL	
21	P2－000－381	FOOT (20－17)	BOTTOM
22	P2－050－141	STAND BRACKET	
23	P2－510－001	BRACKET FOR HANDLE	
24	P6－403－901	HANDLE	
25	P9－510－001	FRONT FRAME	
26	P9－510－002	BEZEL	
27	S4－510－001	FILTER (GRAY)	
28	P3－510－001	CORD HOLDER	REAR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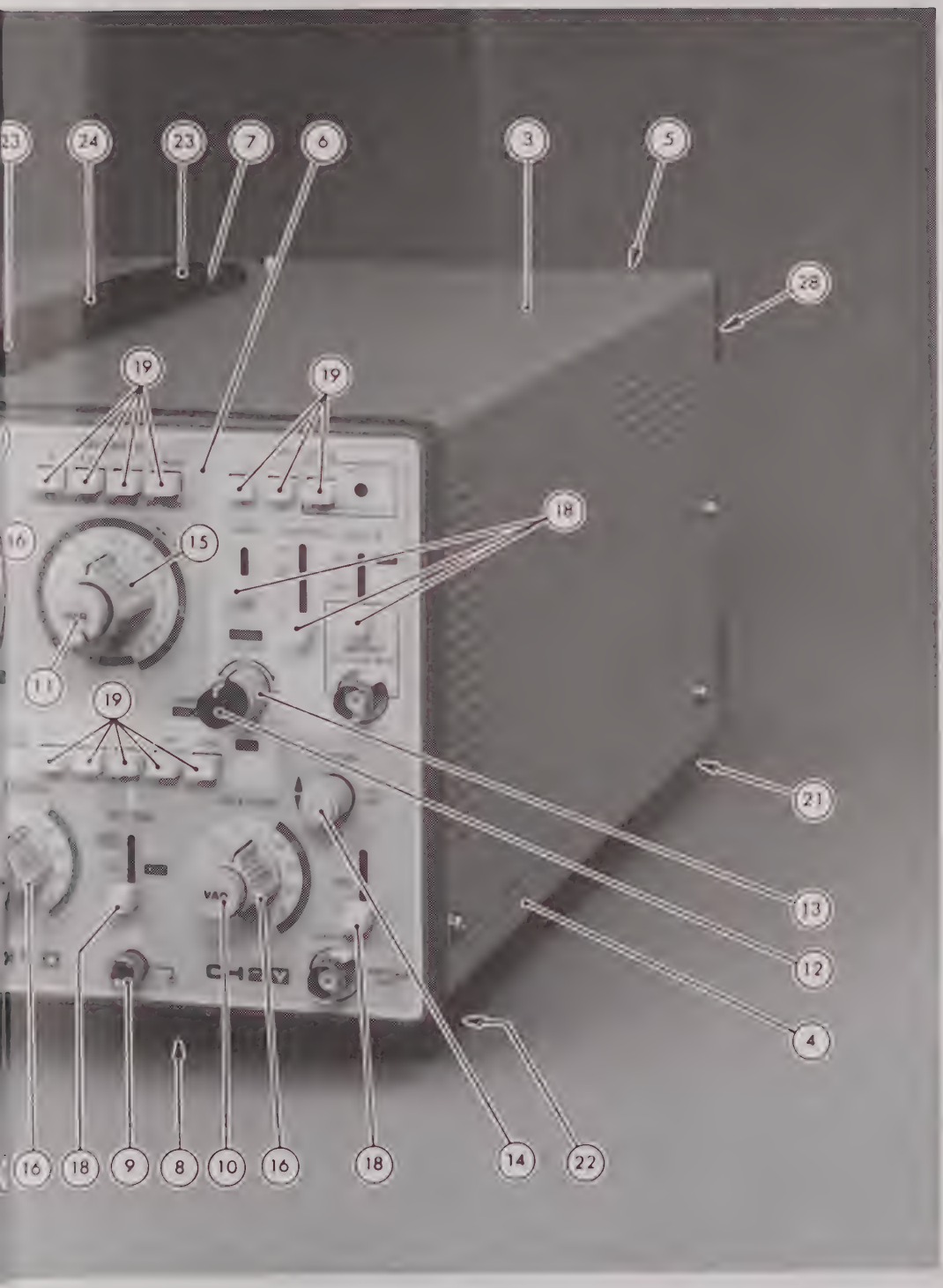
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